



Marketing and Governing Innovative Industrial Areas Integrated guidelines - a handbook





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MARKETING AND GOVERNING INNOVATIVE INDUSTRIAL AREAS INTEGRATED GUIDELINES – A HANDBOOK

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Foreword

The project Marketing and govERning innovative industrial areas (MER) is based on the guiding principle that the green promotion of territories and industrial areas is a key value to invest on. MER aims at arranging an effective network of actors able to concretely influence public policies in the context of Europe2020. This network should be engaged for sustainable economic growth of the MED area. The milestone of MER will consist in networking activities aimed at defining guidelines for promoting and governing innovative industrial areas. The positive results of previous projects and deliverables developed during this project are the base for the Handbook that you have at your disposal.

Marketing and govERning innovative industrial areas integrated guidelines – A Handbook, has been developed collectively in the framework of MED Programme. The Handbook addresses critical issues for policy development at local and hopefully at European level, in order to increase the European territorial competitiveness and attractiveness by applying green marketing tools and strategies to the promotion of industrial areas. The green promotion of territories and industrial areas involves the public, private and community and voluntary sectors working together towards a clear single aim, to improve the quality of life for all. We need to ensure that individuals and organisations are learning from the successes and the failures of others. This demands a solid core of guidelines and best practice best use of all the resources we have available. We have put in place a solid framework to improve the industrial areas' competitiveness and attractiveness of the MED area according to Europe 2020 targets for a sustainable growth. We expect them to be innovative, pushing forward the boundaries of what is achievable.

The partners involved in the development of the Handbook have been:

- Province of Bologna (Lead Partner)
- Chamber of Commerce and Industry NICE COTE D'AZUR
- ANATOLIKI S.A. Development Agency of Eastern Thessaloniki's Local Authorities
- ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development
- FVMP - Valencian Federation of Minicipalities and Provinces
- CEEI Valencia - Valencia Business and Innovation Centre
- UAlg - University of Algarve
- INFORMEST Service and Documentation Centre for International Economic Cooperation
- Urban Planning Institute of the Republic of Slovenia
- Cyprus Energy Agency
- MIEMA - Malta Intelligent Energy Management Agency

Many others have contributed substantially in the development of the Handbook.

We warmly thank them for this.

Introduction

Marino CAVALLO^[1]

The essays that are collected here represent an experiment, in our opinion a rather innovative one, of participatory knowledge.

As commonly known, Web 2.0 is characterized by two basic elements, distinguishing it from previous information and communication systems. On the one hand the first feature is the collective intelligence, that is the existence of groups (even very large ones) of people who decide to share knowledge and skills. On the other hand there is the ever more frequent availability of joining projects along with many other subjects for working together towards a common goal. The experiment that you will find in this book is therefore the concrete expression of these distinctive elements of knowledge in the era of Web 2.0, of collective and shared knowledge, of the production of knowledge supported by technological tools based on social media.

The idea from which we started was to create a collective work where each of the parties involved could capitalize on their experiences and spread them through the channels of Web 2.0.

Moreover this experiment is well suited to projects belonging to the interregional cooperation framework based on the collaboration of partners located in different European regions that are often distant not only in geographical terms but also with regard to socio-economic and territorial features.

Furthermore the wiki book is well suited to host contributions and interventions on the specific issue of this European project. MER means "Marketing and governing innovative industrial areas" and this project aims to spread in Mediterranean Europe good practices and innovative solutions to make these countries become more competitive through the quality of the services provided and through the environmental sustainability of local and regional industrial policies.

The organization of the book gives account of the extreme complexity and variety of themes running through the initiatives of green marketing and sustainable production and consumption, and it tries to apply the methods and experiences on this side to the territory. The most direct way to capitalize on the experiences of green marketing and ecological production at the local level is promoting eco-industrial parks and those industrial areas that are designed according to criteria of high quality concerning environment, urban planning and services management.

The book is divided into four parts. The first part examines the framework of eco-industrial parks and productive areas. In this section there are the main contributions to get in touch with the topics of the book such as the definitions of territorial marketing and green marketing and such as some suggestions for applying these methodologies to the creation of innovative industrial areas. In this section there are also some contributions about sustainable consumption and about the relationship between the responsibility of consumers and digital society. It's clear that any policy supporting ecological production and ecologically

equipped industrial areas will be successful only if driven by a strong demand on consumers' side and by an equally strong attention to the dynamics of the growing demand for environmentally friendly goods and services.

The second part of the wiki book is dedicated to emerging themes and sectors where to develop services and offerings based on eco-innovation. An initial contribution is dedicated to the strategic issue of institutional arrangements for governing productive areas delving into the experiences of some Italian regions. Other scientific contributions are focused on the environmental infrastructures for industrial areas, on how to finance renewable energy plants, on the strategies for designing green marketing plans, on logistics services to promote a sustainable and more efficient management of transport of goods in productive areas and between origins and destinations of products.

The third part delves even more into the many sectors affecting the qualification of territories and of production areas. So we have the opportunity to learn about the experiences in Europe on key issues such as landscape, industrial regeneration and conversion of productive areas. As often stated, attractiveness of regions and regional marketing strategies can effectively work if the conditions offered to businesses are really competitive. For this reason, this section hosts also articles devoted to business services: services for new businesses, services of advanced training for employees, local observers able to outline new trends in market demands and to provide recommendations and lines of intervention for the firms located in a given territory.

The fourth part, finally, is focused on future trends in the field of industrial areas and green marketing. In particular, we have a look at other parts of the world: the United States and China, assuming that that these important economic players, that are crucial due to the weight they represent in the world GDP, can provide important ideas and methodological suggestions. We are also aware that only full and steadfast commitment of these economic giants to the reasons of the green economy can bring a real contribution to a low carbon economy and green economy. From this point of view, some very futuristic solutions to industrial symbiosis, as those activated in Denmark and England, may represent very promising prospects. For example, the circular economy and the bio-economy are undoubtedly a decisive step to reduce waste and the use of raw materials in the production process. To apply this methodology to industrial processes could be a significant step forward; but this working method could also be applied to the flows of energy and materials between different enterprises of an industrial area thus generating circular processes and production efficiency not only at the level of single companies but also at the level of production areas and territory. This will probably be one of the most interesting fields of work in the future to start new projects at the European level with partners and stakeholders able to implement concretely these crucial innovation in European territories.

Finally, a request specifically dealing with this book. This book will not be finished with the publication, but continues dynamically over time. It will change in relation to the articles and papers that people will send to us in the future. This is an invitation to stakeholders, researchers, journalists, companies and local authorities. Let's keep on writing on the wiki book, so that this handbook will not be something completed, but rather something that lives over time, fueled by the knowledge of all of us and all of you.

Note

List of Abbreviations

AEA: Ecologically Equipped Area

APEA: Ecologically Equipped Productive Area

ARPE PACA: Regional Agency for the Environment and Eco-development of Provence-Alpes-Côte d'Azur

CEA: Cyprus Energy Agency

CEEI Valencia: Valencia Business and Innovation Centre

EEl: Energy efficiency improvement

EEPA: Ecologically Equipped Productive Area

EMAS: Eco-Management and Audit Scheme

ENEA: Italian National Agency for New Technologies, Energy and Sustainable Economic Development

EES: Energy efficiency services

ESCOs: Energy Service Companies

FVMP: Valencian Federation of Minicipalities and Provinces

LC: Local Committee

MC: Managing Company

MER: Marketing and govERning innovative industrial areas

MIEMA: Malta Intelligent Energy Management Agency

TPF: Third Party Financing

UIRS: Urban Planning Institute of the Republic of Slovenia

Part 1 The Context for Eco-Innovative Industrial and Enterprise Zones

1.1 Territorial Marketing, Green Marketing, Industrial Areas

Marino CAVALLO^[1]

1.1.1 Introduction

Even if the economic crisis has been destroying a large part of the global wealth and many economic assets, it also swept away some well-established business behaviors of economic actors in the most important countries. In fact, the economic crisis has also raised the possibility of investing in ecology and in environmental protection.

A new paradigm is becoming more and more important: it puts in connection environment, social security and innovative development. In fact it is time to review the priorities and to set up the conditions for enabling a new type of economic pattern, closely intertwined with the surrounding environment. This can be summarized in the concept of green economy. This is the definition provided by UNEP: «green economy as one that results in improved human well-being and social equity, while significantly reducing risks, environmentally and ecological scarcities. In its simplest expression, a green economy is low-carbon, resource efficient, and socially inclusive»^[2]

The relationship between sustainability and green economy is not a relationship where a new concept replaces a previous one. As deeply clarified by UNEP: “the concept of a “green economy” does not replace sustainable development, but there is now a growing recognition that achieving sustainability rests almost entirely on getting the economy right. Decades of creating new wealth through a “brown economy” model have not substantially addressed social marginalization and resource depletion, and we are still far from delivering to the Millennium Development Goals. Sustainability is still a vital long-term goal, but we must work on greening the economy to get us there. To make the transition to a green economy, specific enabling conditions will be required. These enabling conditions consist of the backdrop of national regulations, policies, subsidies and incentives, and international market and legal infrastructure and trade and aid protocols. At present, enabling conditions are heavily weighted towards, and encourage, the prevailing brown economy, which, inter alia, depends excessively on fossil fuel energy”^[3]. Green innovation may bring important opportunities for empowering territorial systems and productive fabrics such as job vacancies, start ups, synergies among economic actors and public bodies.

This essay is aimed at describing how the passage to a sustainable and innovative development may represent an opportunity for enforcing the economic fabric and should be supported by specific communication tools leading to green marketing. Furthermore this essay will point out how turning to a green economic pattern and adopting green marketing tools may be a lever for promoting the whole territorial capital in the framework of sustainable and green innovation. In this respect, this essay will highlight how the role of the policy level is crucial because of their territorial programming powers and how eco-industrial park can be a driver both for sustainable development and territorial empowerment.

In order to translate these principles into concrete actions and tools for economic development, it is necessary to measure the progress towards green economy and to assess the contribution of green economy to economic development^[4] and the impact on communication strategies.

1.1.2 From Green Economy to Blue Economy

Rethinking economics with a green perspective has led Gunter Pauli to propose some suggestive analysis on the current situation. From his point of view, the economic crisis can provide an opportunity for an effective review of the mechanisms underlying the profit of companies and organizations. Instead of aiming at increasingly small margins of profit, which require abnormal economies of scale to provide sufficient earnings, it is much better to invest in quality and innovation.

It is crucial to invest in the proper use of natural resources and in the assessment of environmental impact due to production and industry. Economy of depletion is called by Pauli *red economy*. The concept suggests the idea of a failed system, in respect both to financial results and to outcomes in terms of environmental and social impact. The potential of green economy has been described above. But there are margins for improvement also in this case. Green economy, according to Pauli, actually asks enterprises and consumers to spend more to preserve the environment or it requires substantial investments to improve manufacturing processes or to convert pollutants. On the other hand, it is clear how difficult it is to ask, especially in times of crisis, to pay more for more sustainable and environmentally friendly products and services.

Actual discontinuity, Pauli says, is represented by “blue economy”: a new form of economy based on the same principles by which natural ecosystems operate. Blue economy aims not only to preserve the environment, but also to regenerate it ensuring the possibility of evolutionary paths of the ecosystems and a constant flow of creativity, adaptability and abundance of nature.

The principles of this new economy refer to the conceptual models developed several years ago by economists such as Nicholas Georgescu-Roegen and Herman Daly. Georgescu Roegen, for example, has tried to introduce the principles of thermodynamics in the laws regulating the economy (Georgescu Roegen, 1998). In particular, he focused his attention on the second law of thermodynamics, which shows the inevitable degradation of energy used in processes and activities involving exchange and use of energy. Energy is not conserved, but it is rather incessantly consumed: this is why it is necessary to carefully assess the final energy balance of any application consuming energy. In the footsteps of this approach, the American economist Herman Daly highlighted the need to plan the levels of economic growth capable of maintaining the whole system in a steady state. This implies a careful planning of the exploitation of resources and of the benefits arising from industrial development and production^[5].

1.1.3 Green marketing and territorial marketing: an alliance for empowering the territorial capital

The positive impact of rethinking economics with a green perspective has to be highlighted by specific communication strategies leading to green marketing.

Green marketing is a strategic mix-up of different components to be managed, such as: know how and actions to operate in the eco-market; managerial and commercial plans to minimize the environmental impact of productive activities; matching between green demand and green offer; research and development of competences for the promotion of green products and greenservices; planning of actions to maximize the opportunities of green market and to allow the reaching of environmental goals.

In respect to the aim of this paper, it is worth highlighting that green marketing shares many fields of intervention with territorial marketing: in fact to promote in a sustainable perspective tangible and intangible capitals of an industrial area means to promote the competitiveness of the overall territorial supply. The territorial supply can be considered as the complex of tangible and intangible components, characterizing the territory they are placed in and, at the same time, affected by the territory.

The marketing of the territory is a function that contributes to the balanced development of the area through the design and implementation of an interpretation of the spatial features in terms of identified segments of supply that meets current and potential demand, this satisfaction is achieved through creating a net positive value (Caroli 1999).

Another definition of territorial marketing is more oriented to capture dynamic and relational features between the actors of the territorial marketing process. According to this definition, territorial marketing is aimed at maintaining and strengthening positive relations with local stakeholders (internal territorial marketing) and with external audiences (external territorial marketing). The main objective is to increase the value of territory and its economic attractiveness, by activating a virtuous circle of satisfaction-attractiveness-value^[6].

Green marketing and territorial marketing can establish an alliance as a lever for territorial competitiveness. The unstable and competitive economic scenario of the last decades has made socio-economic players aware of the importance of marketing both for attracting new investments and for retaining established businesses that might consider alternative locations (e.g. countries offering cost savings and production factors or incentives and tax relief for promoting development and industrialization).

Territorial competitiveness, according to the analysis proposed by Matteo Caroli, determines a sort of virtuous circle, where contextual local conditions (availability of financial resources, know how, skills, infrastructure and intangible assets) generate real competitive advantages for the firms located in that territory. The last step is the production of the value created by local companies for the benefit of that territory. In fact, the relationship between companies and territory results in net benefit for local institutions, so that they can count on more and better resources – which can be reinvested by starting a positive circle and mutual interaction between the local context and the existing production system (Caroli, curated by, 2011)^[7]

1.1.4 The role of the policy level in green territorial marketing

In the last years the concept of “green economy” has become part of the mainstreaming policy discourse. The recent attraction for the issues dealing with green economy has been affected by “widespread disillusionment with our prevailing economic paradigm, emanating from the many concurrent crises and market failures experienced during the very first decade of the new millennium, including especially the financial and economic crisis of 2008. Governments are more and more committed to leveling the playing field for greener products by phasing out antiquated subsidies, reforming policies and providing new incentives, strengthening market infrastructure and market-based mechanisms, redirecting public investment, and greening public procurement”^[8].

In this framework, much attention is being focused on enhancing the role of European Regions and macro-regions as central actors in international and global competition. Globalization has brought – according to Sergio Zucchetti – a sort of polarization of the impact on economy. On the one hand, the challenge is more and more similar to a match between some sets of firms, regions, and production systems. On the other hand the free flow of ideas, financial capital and goods imposed to national and local bodies to give powers to transnational regulatory bodies, and to entities more extended than a specific area (Zucchetti 2008)^[9] “Europe of regions” well summarizes these opposite thrusts. The competitive project to invest in territorial marketing actions should take sustainability as a value capable of integrating all the instances governing the relationship between marketing and development. In particular, this project should keep together economic competitiveness, social capital (and common goods that feed it), and environmental sustainability of economic choices (which implies the ability not to jeopardize future initiatives with a strong impact on ecosystem).

As for the local policy level, adequate public policies and a careful planning by local authorities become key actors for the enhancement and diffusion of green marketing plans to be applied to local territorial systems and to local industrial areas.

On the base of the perspective described above, it is increasingly clear that the key for a successful attraction of investments largely depends on the identification of the optimal level of targeted marketing policies. In fact there is a very strict connection between local economic development and green territorial marketing: enhancing the territorial system can actually be a strategy against crisis and can represent an added value in the competition among territories.

There are many examples of local marketing plans, regional and area wide plans, and national plans and it is worth noting that regional levels have a wide variety of experiences, operational approaches and management of needs. The need of marketing-oriented regional policies is probably due to the high level of integration required to carry out incisive actions for territorial promotion.

In fact, determinants of attractiveness, according to Caroli, include tangible, material capital, intellectual capital, and policies for development. The first category includes geographic location, topography of the area, and environmental conditions in a broad sense. The second category includes social and economic infrastructures, productive resources essential for companies localized in the area, and local business system. In the third category there are elements taking an increasing importance: social capital, spread skills, well-established

vocation and corporate image. Finally, we have to mention policies dealing not only with rules and regulations but also with procedures for the use of public goods and services with benefit for territory and business.

In the current situation it is indispensable to understand the evolution of the concept of territorial attractiveness and to focus on factors determining success in close challenge and global competition between different areas. From this point of view, local and regional marketing policies offer a strategic, coherent and integrated support for an efficient use of public resources, for the development of public-private partnerships in management and supply of services, for product innovation, and organizational strengthening of local business^[10].

1.1.5 Eco-industrial parks: from the technical features to the strategic green potentialities

Eco-industrial park may play a very active role in empowering a green approach to development and sustainable growth.

The close relationship between blue economy and innovative design of eco-industrial parks is embodied in sharing some principles that are borrowed from biomimetics. Biometrics derives from the observation of the behavior of ecosystems, the closure of cycles in the use of resources, integration of material and energy flows in order to encourage reduction of waste.

Some of the main features of Eco-industrial parks are the following: planning of energy exchanges within industrial areas and between production units located in it; devices and systems to minimize energy use and raw materials; reducing waste materials; establishment of relationships that can simultaneously improve social, economic and environmental contexts businesses are located in. The main characteristic of an eco-industrial park is the presence of symbiotic processes to create a sort of "bridge", or at least very strong analogies with bio-mimicry.

Eco-industrial parks aim at closing cycles and maximizing efficiency of materials used in production processes. The implementation of eco-industrial parks may be favoured by some priority actions. Planning eco-parks requires highlighting managerial conveniences and competitive advantages for companies who decide to settle in eco-parks. An eco-park can save resources because there are common shared services; as well as efficiency because of innovative solutions and economies of scale. Other points of strength are: propensity to network, to be able to share results of innovation, to create networks of exchange that can improve the flow of materials, energy, and information.

Apart from technical features and from technical requirements, eco-industrial parks may play a strategic role for the the whole territorial development not only from the environmental point of view but also in more general terms. In order to develop this potential, the role of green marketing and territorial marketing is crucial.

1.1.6 Green Marketing for Industrial Areas

Until now green marketing has been limited to the identification of strategies and actions necessary to make a company (or a group of companies) more attentive to environmental issues. This involves monitoring effects of waste, scrap, lead emissions on surrounding environment to search for appropriate solutions to improve the relationship between business and environment. Other companies are now working meticulously on product features in terms of packaging, life cycle of materials, certification of subcontracting chain, and sourcing of resources and raw materials. Finally, there are management tools and management processes that enable companies to improve their energy efficiency, reducing emissions or harmful materials, optimization of distribution and logistics associated with the introduction of a product on final market (Foglio 2008).

Consistent with these approaches, increasing importance has been taken on over time by eco-labels, environmental quality labels and certified environmental management systems, based on similar systems that have met great success in the field of total quality and certification of supply chains.

These systems have not reached the level of coverage and dissemination of quality management systems. Label, ISO 14001, EMAS, while being adaptable to different industrial instruments, found only partial an adequate dissemination in small and medium enterprises. There are many reasons for this and many researches agree on a common interpretation of this issue. These management systems are expensive and require highly specialized structures, dedicated organizational units, business database and complex management software. These investments can be hardly afforded by small businesses (Cariani, Cavallo 2009)^[11].

An increasing attention to green issues is crucial in the analysis by John Grant, which offers a real "Green Marketing Manifesto". This can disrupt established habits and deeply change all the attitudes tending to oppose economic profit, business and budget to sustainability and environmental sensitivity. On the contrary, in the approach proposed by Grant, green marketing becomes a real opportunity that can change visions and attitudes driving the choices of individuals and social groups. The matrix he proposes lines up the steps that companies can follow: from greener and greener behavior. In terms of concrete actions this means to mark the difference between an occasional good example and an innovative, ambitious and challenging new business concept, which incorporates values of green marketing in the very nature of new products and services (Grant 2009).

However all these observations have been developed for individual organizations, or at least for large companies that manage brands and product lines differentiated from the point of view of sector or commodity^[12].

Eco-industrial parks may be an occasion to develop tools and methods of green marketing oriented to industrial areas and clusters that may be adopted by economic bodies involved in local development.

We will briefly provide below some contents that have to be included in the marketing plan of an eco-industrial park. Each production area should adapt them to its context and to the type of firms that are already settled in the area or that you want to attract there. The analysis of

competitors can be achieved by performing benchmarking studies through a set of indicators divided into the following categories: local structural characteristics, characteristics of environmental management, research and innovation activities, green marketing and communication activities provided to promote the opportunities available in the area.

This comparison can provide very useful suggestions on the placement of a new area and on the package of services to develop^[13].

As explained in the Handbook of Green Communication and Marketing developed within the European Med project Ecomark, the operational components of a marketing plan should be aimed primarily at developing the key areas of an eco-industrial park: urban and territorial area, environmental area, socio-economic area, and area of services management. The marketing strategy should highlight the points of strength of each one of these areas in order to improve the positioning of the eco-industrial park in respect to its competitors and to make it more suitable for new investments by companies or for the expansion of existing companies.

The set of services provided by an industrial area is the actual field where the competition with other regional systems can be won thanks to the quality and value of services provided in comparison with other areas. Furthermore, providing a specific type of service can support the positioning of the industrial area in respect to its competitors and it can be a lever for the promotion of the area.

In this competition among territories, regions and local systems, it is worth investing in the creation of a "territorial brand" in order to communicate the specific vocation of the territory and its excellence. The environmental quality can be a strategic component of this territorial brand because of its consistency with the spreading demand for sustainable products and services that can be applied also to territorial marketing strategies.

In promotional and communication activities it is essential to divide targets among established firms (brownfield) and businesses to be attracted from scratch (greenfield). Promotional activities involve media (new media and media) campaigns, detailed planning of specific actions aimed at different segments (for example developers, trade associations, business groups, business consultants, etc.). A "red thread" for the communication of territorial identity can be achieved through a "concept", made of logos and messages to be repeated over time in order to create a cognitive and conceptual frame. This conceptual red thread has to be recognized in an increasingly rapid and intuitive way. As a branded product, that becomes uniquely identifiable by a brand, each area should aim at creating an actual brand integrating territorial features and values to attract businesses, investors and talents on a specific industrial area^[14].

1.1.7 Conclusions

The green marketing applied to productive areas is a still largely unexplored theme. While there are many experiences in the field of marketing for green products and services, there are few proposals for green marketing targeted to areas, territories and industrial parks. Anyway the local development and competitiveness of the European countries in the coming years, will depend more and more on the capacity of these areas to offer innovative services to businesses.

The European regions of the Mediterranean area can effectively intercept the demand for high quality of life and high environmental quality, that are becoming increasingly important social themes, and they can use these common needs to effectively promote their industrial areas. As in the past there were forms of green supply chain in production, today it is essential to focus on optimizing tangible and intangible exchanges between companies, by applying industrial symbiosis at the national level.

The principles of biomimicry and closing cycles of resource use in the productive areas, may represent factors of innovation, efficiency and can minimize waste and adverse impacts on the environment. These approach can become a lever also for promoting the whole territory: it is time to invest in local marketing and to integrate the promotion of industrial districts, production chains, and clusters with the promotion of the so-called “territorial brand”.

On this basis, new territorial marketing tools can be implemented by paying particular attention to sustainability, environmental quality, and urban development to innovative services for businesses and to consistent audit of business needs.

These will be the terms of the challenge for future development which will be made of intersections between innovation, effective management of resources, expertise and know-how.

NOTES

1. Province of Bologna
2. http://www.unep.org/greenconomy/portals/88/documents/ger/GER_synthesis_en.pdf
3. http://www.unep.org/greenconomy/portals/88/documents/ger/GER_synthesis_en.pdf
4. Cavallo, M., Degli Esposti, P., Konstantinou, K., (curated by), Handbook of Green Communication and Marketing, Franco Angeli, Milan, 2012, p.42
5. Ibidem, p.44
6. Valdani E., Ancarani F. (edit by) (2000), Strategie di marketing del territorio, Milano, Egea.
7. Cavallo, M., Degli Esposti, P., Konstantinou, K., (curated by), Handbook of Green Communication and Marketing, Franco Angeli, Milan, 2012, p.48
8. http://www.unep.org/greenconomy/portals/88/documents/ger/GER_synthesis_en.pdf
9. Cavallo, M., Degli Esposti, P., Konstantinou, K., (curated by), Handbook of Green Communication and Marketing, Franco Angeli, Milan, 2012
10. Ibidem, p.48
11. Ibidem, p.50
12. Ibidem, p.51
13. Example of international benchmarking developed within the european project "Ecomark": www.ecomarkproject.eu.
14. Cavallo, M., Degli Esposti, P., Konstantinou, K., (curated by), Handbook of Green Communication and Marketing, Franco Angeli, Milan, 2012, p.54

1.2 Policies for the Ecologically equipped productive areas' (EEPAs) development

Matteo CAROLI^[1], Alfredo VALENTINO^[2]

1.2.1 Introduction

The EEPAs can be considered the “Italian version” of the eco-industrial parks mostly developed in the United States, Canada and in the northern European countries. As well

known, an eco-industrial park (EIP) is a community of firms that through cooperation and eventually with the support of local institutions minimize the environmental impact of their production and find the best balance between economic and environmental performance (Lowe, 2001). Therefore, within an EIP firms are able to reach the best equilibrium among efficiency, environmental impact, and competitiveness. The key factor of an EIP is the offer of the best conditions for the “industrial symbiosis”: an integrated system of resource management which minimizes the use of material resources among hosted companies, and optimizes the recycle of wastes helping the cooperation among companies to reach environmental targets.

EEPAs were established in Italy by a national law more than fifteen years ago. Since then, the development of EEPAs has been rather slow and has not changed considerably industrial areas. It is necessary a strong policy action to support EEPAs’ development, particularly within the “Sustainable Consumption and Production” framework.

The MEID project has defined a model for implementing a sustainable industrial area, underlining the following most relevant elements^[3]: i) an official managing company; ii) a shared process for a joint industrial policy; iii) the involvement of local stakeholders; iv) an Environmental Management System of the area (environmental policy, monitoring plan, improvement plan, communication procedures); v) centralized infrastructure and innovative services; vi) sustainable industrial buildings. In the following section, we propose policies for EEPAs that take in consideration these elements.

1.2.2 Policies for EEPAs development’s main objectives

Policies for EEPA’s development are part of the policies for the integration of sustainable consumption and production (SCP) in the MED Area. Therefore, they have to be finalized to make SCP an approach which does not reduce companies’ competitiveness, but possibly helps them to find new, and sustainable ways to be competitive in international markets.

It is important to remind that in Italy, as in other MED countries, regional governments have competences on EEPAs and generally on the development of industrial areas. Thus, policies for EEPAs’ development have to be planned primarily at regional level^[4]. Notwithstanding, we believe National policies are also required, especially to define the framework that can support regional government’s specific measures.

The key aim of policies for EEPA’s development is to make the EEPA and the whole territory where it is located an “eco-system” where firms find advantageous conditions for their sustainable development. The development of an effective eco-system makes the EEPA attractive as an area where to locate productive investments.

There are five basic conditions to make the EEPA an “eco-system” where companies can thrive:

- a good number of companies and productive plants located inside the industrial park;
- the presence of a certain number of companies that can act as “hubs” of the eco-system due to their economic size and relevance of their relations with the national and international markets;

- the presence of economic institutions, research centers and departments, laboratories, and so on, in the industrial park or at least not far from it;
- the concrete opportunity for companies and other private/public actors located in the EEPA to benefit of relevant economic and/or competitive advantages;
- the willingness of companies, other private organizations, local government and other public institutions to cooperate with the common aim of promoting the sustainable development of the territory where they are.

Policies for the development of the EEPAs have to take into account these five conditions and to overcome the weaknesses that currently reduce the EEPAs' attractiveness.

1.2.3 Main EEPAs' weaknesses

In the Ecomark project researchers have realized an "international benchmarking of industrial areas". This benchmark is particularly focused on: environmental management, logistic and mobility management, communication and green marketing, R&D. The benchmark highlights some flaws of industrial parks^[5] (with relevant differences in different European regions): first of all, the scarce perception of the value created through green marketing and sustainable logistics management. Specific tools are required to strengthen this perception because generic ones usually provided in industrial parks are not enough. It needs also to improve competences and resources in communicating environmental issues. The benchmark also shows that *"there is not a well-established tool-kit to innovate the management of logistics"*; and the reduction of energy consumption is one of the key areas where environmental investments are pretty high in the most of industrial parks.

Focusing on the Italian system of EEPAs, we note that there is a very uneven development between the different Italian regions. EEPAs are relatively well established in Tuscany and Emilia Romagna, while other regional governments have only approved the set of rules to make an industrial area compliant with the characteristics required to be an EEPA (Piedmont, Abruzzi, Liguria, Calabria, Puglia). However, in some Italian regions there are not even any concrete evidences of the EEPAs. This is the result of the national law number 112/1998, that established EEPAs, giving to each regional government the responsibility to regulate the development of their industrial areas.

This heterogeneity reduces the opportunity to consider the EEPA as a general model of industrial parks, as a benchmark that any other industrial park should follow. Moreover, after more than fifteen years the partial implementation of this law at regional level increases the perception of EEPA as an ineffective model or at least as not the best solution to implement.

Another key weakness is related to the uncertainty about the concrete economic or strategic advantages companies can achieve being part of an EEPA. Theoretically, firms get the following benefits: relevant environmental costs' savings, the strengthening of their reputation as a "sustainable" company, the improvement of its relation with local government and institutions, the reduction of administrative costs, the development of its social capital and business network (Lowe, 2001). These potential advantages result from the proper organization and management of the EEPA, and the presence of an adequate number of firms. However up to now, even in the most relevant available experiences, these advantages are still out of reach. Moreover the medium-long term nature of these advantages increases firms' negative perceptions. In the first year it is likely that being settled in an EEPA does not

generate significant positive differences respect to companies located in other industrial areas. Concrete benefits can be achieved only in the long run. As a consequence, being in an EEPA can be expedient only for firms which have a long term vision, a strategic and sustainable approach to business, and resources enough to back this vision and approach.

On the other side, firms in EEPA may incur higher costs because of the strict environmental norms adopted by the EEPA to be recognized as such. These costs stem from the more strict environmental parameters required to productive activities, or from the request of “sustainable” behaviors which require specific investments or expenses. To be compliant with EEPA’s environmental aims, companies should also incur costs of organizational improvement: new organizational capabilities, new configuration of some value chain’s activities, and the adoption of new procedures.

From firm’s perspective, the settlement in an APEA can be considered like an “extra investment”, but also as an increase of complexities and, maybe, of costs which generate a future real option that may increase the medium-long term results of the whole investment. It is pretty clear how difficult it is for companies, especially for SMEs, to face this “extra investment” in the current deep crisis phase of internal markets and of decrease of production level.

1.2.4 The content of the policy for EEPAs’ development

Policies to support EEPA’s development have to stimulate the development of a good eco-system for firms located within the EEPA. At the same time, they have to overcome its weaknesses, making sustainable the implicit investment firms have to face in order to be located in the EEPA.

Measures both on the “demand” side and on the “offer” side are required. We define the first ones as measures aimed to stimulate the willingness of companies to incur the “extra-investment” to be located in the EEPA; the second ones are measures aimed to strengthen the characteristics of EEPA to improve involved companies’ competitiveness; in other words, measures to strengthen the EEPAs’ attractiveness.

On the “demand” side, it is relevant to provide firms (especially SMEs) with proper incentives to locate their plants in the EEPA. We underline the relevance of incentives, also in consideration that MEID and Ecomark reports highlighted the lack of them to support the adoption of SCP perspectives from SMEs^[6]. Those reports underline that *“usually, if provided, the environmental incentives concern only the theme of energy consumption, efficiency and renewables and do not cover other environmental themes”*. Incentives are particularly relevant also to balance common problems faced by firms in the current economic phase: scarce availability of financial resources, strong necessity to reduce costs and improve efficiency, decrease of economic margins and reduction of demand.

Incentives can be economic in nature, but also administrative simplifications and regulation reliefs that strongly influence the effectiveness of investment’s procedure and as a consequence its overall cost.

Monetary incentives have to be used very carefully because their effects are only in the short term and are not able to generate structural improvements. Many economists and experts

involved in SCP program have criticized these incentives, underlining their negative effects on company's innovation and long-term competitiveness. From the local community's point of view, monetary incentives are costly and they might not generate sustainable and long-term development. However, they can be very effective in generating quick (even not structural) effects. They are one among a bunch of tools, and probably, not the most relevant. It is also important to define mechanisms which are effective to reach strategic objectives.

So, monetary incentives should be organized as a "rotation fund": firms, that have benefited from financial aids to invest in the EEPA, have, after some years, to give back a percentage of them, in proportion of the advantages concretely got by the location in the EEPA.

Another option is the automatic reduction of company's fiscal burden (tax incentive) in proportion of the resources invested in the EEPA, eventually weighted on the investment's relevance for the territory's sustainable development and on its degree of innovativeness.

Innovative financing tools can also be developed to support SMEs' settlement in the EEPAs and their access to financial capital to reach the long-term targets of sustainability.

If a wider use of incentives was considered acceptable, the EEPA could get the advantages recognized to the "free economic zones". In recent years, also in Italy, National governments have started to support the development of this kind of areas, especially in the less industrialized southern areas and only for the development of small firms. A wider adoption of this kind of policy would require a careful analysis of the institutional framework and of the specific conditions that have to be respected.

Policies for the EEPA's development have also to support the "offer": the aim is to make the EEPAs attractive for the target companies as much as possible. To make these policies effective, it is useful to consider the main obstacles that during the last ten years have hindered the EEPA's success. The uncertainty about the concrete advantages of being in this kind of industrial areas, the compliance with environmental laws and targets, and the complexity of their governance have played an important role. The following five strategic actions can be considered as a solution of these problems:

- to strengthen business services available to firms within the EEPAs;
- to strengthen the environmental infrastructures the EEPAs provide to the hosted companies;
- to plan and support long-term environmental projects aimed to involve in EEPA as many companies as possible;
- to plan and implement a marketing strategy for a single EEPA and for the "system" of EEPAs;
- to improve the EEPAs' governance.

These five strategic actions need to be planned considering all EEPAs in the same region as a network that should be as much integrated as possible. Therefore, the policies to strengthen the offer may be enriched by another strategic action aimed to develop the integration among the different EEPAs within the same region. This integration is relevant in offering business services and in creating environmental conditions, which have positive impact on companies' competitiveness. It is also relevant to promote projects to integrate logistics activities and energy management.

Public authorities, that control the EEPAs, should access to financial resources and they are able to provide the EEPAs with all the environmental infrastructures. Moreover they have to give the hosted companies concrete opportunities to improve effectively their production's environmental impact, and at the same time, to give them the chance to strengthen their competitive advantage.

This improvement regards firstly the business services that help hosted firms to reduce the environmental impact of their productive activities and to improve their overall "sustainable production". It is also important to support within the EEPA or within a network of EEPAs the offer of services that help companies to innovate both their production process and their output or even their value proposition in order to make them more sustainable. This means to help companies to understand how to innovate in order to create "shared value" with the whole local community. Services that increase the capabilities of hosted companies, and particularly of the SMEs, to enter in international markets have also to be backed. In particular it is important to support companies located in the EEPAs to exploit their environmental excellence as a competitive advantage in foreign markets.

It is also relevant to activate mechanisms that increase firms' interests toward the offer of business services and their capability to effectively interact with their providers.

The support for marketing strategies is relevant because there is a widespread lack of knowledge on EEPAs and on their potential benefits (more generally, on SCP) both among companies and local authorities and stakeholders in general. The marketing strategy should firstly better understand the needs of different involved stakeholders (companies, governments, residents, etc.); then clarify EEPA's value proposition for each of these "client" categories, and define the actions to develop the EEPAs structure and characteristics which make these value propositions concrete and well perceived.

The improvement of EEPA's governance regards the establishment of a managing authority/company with high level of competences and the administrative power to make the EEPAs attractive for companies and investors. Another important role of this authority/company is to foster the cooperation among hosted companies, and among them and local authorities and other stakeholders. Moreover, its main aim has to minimize bureaucratic costs and problems.

In defining the action plans to implement these policies, it is important to remind that regional governments have direct competences on the EEPAs' development. Therefore, they primarily have the task and responsibility to draw and implement these actions. We believe that also the national government plays a relevant role both in supporting the regional actions and in creating general conditions, which increase the EEPA's potential competitiveness; in particular, it can involve the EEPAs in the policies and measures to attract foreign investments.

The national government has also to overcome the lack of integration among the different policies about the sustainable development: innovation; territorial cooperation; development of "green economy". It also has to strive for a harmonization of standards and norms, looking at the best available practices, and considering economic differences among regions. Harmonization should be developed both at national level and at the UE level.

1. Department of Economics, Luiss University
2. Department of Economics, Luiss University
3. Cfr.: Harmonization of Policies recommendations for the integration of sustainable consumption and production in the MED area – final report, draft April 2014, p. 88
4. The whole SCP is considered part of a regional development strategy. All experts involved in the SCP MED programs agree with the assumption that “SCP policies are pivotal to regional sustainable development due to resource savings and job creation that they can generate at the local level”.
5. Cfr.: Harmonization of Policies recommendations for the integration of sustainable consumption and production in the MED area – final report, draft April 2014, p. 89
6. See: Harmonization of policies recommendations for the integration of sustainable consumption and production in the MED area – final report. Page 90

1.3 From consumers to prosumers, being green in the digital society

Piergiorgio DEGLI ESPOSTI^[1]

1.3.1 Introduction

The rise of green consumption has gained interest in contemporary society. It portrays a positive perspective of consumerism in the sense that it increases the value of production without using traditional commercial mechanisms that are tied to marketing. The concept of Green Marketing 2.0 resides in the application of models that are a premise for a systematic change; a change, rather, in an attempt to overcome the contradictions that lie within temporary marketing.

Man and nature have always lived in a symbolic yet conflicting relationship. The ecological theory, in foundation, is to accompany biological evolution to the growth of historical practices of man. This is the natural way of environmental living: to consume without waste, to utilize without damaging, to progress without destroying. It is all lived and practiced within a timed cycle, where there exists a founder and a bringer of rituals that respects the sustainability of the resources. The problem of this ideology is the concept of power, where the culture of the western hemisphere has, for a long time, been based on the Darwinian notion of natural selection and the capacity of adaptation to the establishments of modern species.

The central themes of political debate and of marketing have become the social responsibility of business, the environmental impact of the model of growth, the reflections on de-growth (Latouche 2011) and sustainable growth, and the movements of critical consumers; constringing politics, business, and the distribution to reason in terms of authentic green marketing and not only of its simulations.

1.3.2 Prosumers movement and social corporate responsibility

In this context, it is clear that if the profit must remain as the heart of the business companies must change their ways of obtaining it. The creation of value from part of the businesses must configure it in relation to all of its stakeholders. Marketing, the principle instrument to realize this shared value, is the reassurance to establish virtuous relations between business and bringers of interest competent to insure cold economic results not redeemed, however, from

those of general social interest. More than ever is the connection between these two spheres of operation evident and economic profit cannot put it in contrast with the creation of value for the society. The so called green consumer is a changeable and a diversified social actor that practices choices of multifaceted consumption and of a complex nature. Along these lines the green consumer could be considered a target in the classical manner of the term, but rather represents the style of consumption, or a group of ways and familiar expressions of a political vision of the world, of preference of style and of taste, transmitted from the copresence, in the choices and the behaviors of consumption, of three capitals: social, cultural and economic (Bourdieu 2005).

The principle characteristics of these consumers derive substantially from the prosumer and the attitude derives from the models of growth proposed in contemporary society.

The prosumer is the crisis of "producer and consumer" and indicates the active role that subjects want to have in the process of consumption: they intend to release themselves from the role of the mere consumer and fully reclaim the process of value creation, offering hours of free work to favor and to sustain that which they consider their passion. Often they are very faithful to labels, determined by the logic of the communities. It deals with consumers that, on average, present a high technological literacy, a discrete social and cultural capital, good availability of time in which they are able to involve and influence others that, like them, want to play the role of a protagonist in the process of consumption. They love to discover, modify, elaborate, and personalize their gains and in their own kind are also the first adaptors to determined goods. The abundance of products at the disposal of the traditional consumers and the growing economic crisis, they push many subjects to reinvent it not only in ways of optimizing determined objectives, but also in distributive ways or substitutive functions for useful everyday products. In this context the technological evolution and the digitalization of the objects of consumption, represent an enormous opportunity for prosumers, not only from the point of view of the creative reinterpretation of definitions and of wonders that the world of the objectives offers (Douglas 1984), but also and on top of everything from the point of view of the informatics empowerment. The digital prosumer is connected and informed and only apparently can it seem a victim of a process of manipulation from the part of the global corporation (Fuchs 2001): in reality taking advantage of the processes of cultural convergence (Jenkins 2007), the culture of the remix (Lessing 2009) and the collective intelligence (Levy 1998), participates actively to the process of consumption. The other relevant aspect of the characteristics of the green consumer is the critical aspect and its attention to eco-sustainability.

The prosumers consider the act of consumption as primarily a political action: they are informed and connected, although they do not necessarily demonstrate a high level of technical knowledge using the network (Internet) and networks (mutual aid) as the main tool transmission of information and value. The prosumers also believe that businesses with an economic objective should have a social function thus they are very sensitive about so-called CSR (Corporate Social Responsibility). Prosumers also require that products be fair and equitable because they believe that another model of development is possible. They are very attentive to the consequences of their actions with their purchases and criticize the society of consumerism, waste and reuse products and recycle materials they love. They do not consider the obsolescence of products as a negative value because indeed the product can recover the value of the coating (Codeluppi 2001) as a symbol of capital mentioned above: we endeavor to find alternatives to the obsolescence of their planned purchases. They are cohesive and able

to mobilize in support of social causes, both in the network in the squares: examples including the numerous global grassroots movements that use the network as a sounding board, and also the ones that live and spread within a given territory with the aim of promoting a critical and alternative development (*Occupy Wall Street*, *Occupy the World*, and the *No Tav movement of the valley of Susa* are some examples).

Prosumers are generally wary of branded products, but are more favorable of and more willing to reward brands that make political choices in favor of their causes. The focus on sustainability within most product categories is guided by a number of factors that makes it impossible to talk about these in terms of niche markets: they must be regarded as a segment all its own with its own peculiarities.

The main factors (which over time have meant that consumers gradually lend more attention to these issues, in addition to the obvious personal bias) are: the push of legislation to facilitate purchases and sustainable production, of fuel energy, social inequalities, the economic crisis and also the fashion factor. The green consumer has evolved from a niche group thanks to the growth of communities of consumers who are particularly sensitive to environmental pressures and criticism of the development model of hypercapitalism. The movement of green consumption is polymorphous and homogeneous inside, but overall it opens the door to a strategy of customer involvement, which is deeply tied to its values and its identity as being ecologically oriented.

Technological development, in this situation plays a key role with regard to supporting all initiatives that are oriented in some way to raising awareness of the reduction of environmental impact. Being green and sustainable today may not only mean being fashionable, but more importantly it means being a responsible and active consumer.

The green consumer pays a lot of attention to tradition and the recovery of ancient wisdom and, on one hand is a prosumer, while on the other hand is a handyman-craftsman who actively utilizes skills and knowledge of DIY; today more and more powerful thanks to digital technology and the sharing of network knowledge. Fabris calls this process 'fine-tuning', which means «to carry out corrections by the millimeter constantly, moving the tuner knob to maintain the correct wavelength, because the consumer, sometimes subtly, sometimes with sudden accelerations, is constantly evolving» (Fabris 2008).

1.3.3 Green marketing form a contemporary perspective

Green Marketing 2.0 means thinking about the green paradigm in a broader way. According to Fabris (2010), economic growth (generalized mean wealth) even when faced with delays, inequality, and environmental disasters no longer represents an attractive development model since the processes of globalization, instead of absorbing the differences and inequalities, are exacerbated. Today it is politically correct to interpret the concept of growth, together with that of long-term sustainability. Only in this light, the growth recovers all its appeal in which the well-have is not confused with the well-being.

In such a scenario technology and its critical use are crucial; particularly through the opportunities for change and innovation that encompasses it.

Ownership of physical capital, characteristic of industrial civilization, is becoming less important: «intellectual capital is the dominant force, the most coveted element of the new era. In the new economy are ideas, concepts, images – not things – the basic components of value» (Rifkin 2000).

This position is shared by Bauman, who points out that «today, the main forms of profit [...] tend to be more and more ideas rather than physical objects. The ideas are produced only once, and then continue to produce wealth depending on the number of people that manage to attract as buyers /customers/consumers, not by the number of people hired and entrusted to replicate the prototype» (Bauman 2008). The new communication tools and 2.0 technologies are a key element in the development of green marketing, confirming the view taken by Jenkins (*op. cit.*), according to which technology should be pointed out not so much the technical aspect, but the cultural practices in which they enable. Consumers are moving into an archipelago of different tools that allow them to communicate with different audiences – blogs, social networks, buying groups and interest groups of various types – creating cultural convergence characteristics that are determined by the differences that exist between professional and amateur, between consumer and producer of personal communication and mass consumption contemporary media. The structure of the universe allows us to state that none is excluded from this role. The use or choice of products or services implies the possibility of giving an interpretation of cultural and express a vision in line with previously expressed, «a purchase is equivalent to one vote» (Giordano, Pallera, Barnes 2007). Therefore, in contemporary society the activities of consumption can be considered to all effects as an activity of production, material or symbolic, which helps to generate value. The easing of borders and the cultural convergence do nothing but intensify that process. The sharing of common interests, specialist products and community interests is the cornerstone that supports the Web 2.0. In neo-tribalism the sphere of consumption is an important issue for both the green marketing and for Web 2.0: «many strong brands come in association with a particular type of user or tribes, which became the icon. The ability to recruit and retain these communities that form the core of a brand is enormously increased through word of mouth and social networking on the Internet» (Grant, *op. cit.*). If we have previously outlined what features should characterize an approach to "green", we now provide an indication on the differences that such an approach presents against the classical marketing. The reference to the Green Marketing Manifesto for tracing so-called "5Is" (see below) in green marketing as opposed to the "4Ps" of marketing classic. The new marketing footprint must be:

- intuitive;
- integral;
- innovative;
- inviting;
- informed.

The first bullet point, Intuition, is to indicate the need for choices and behaviors that has been recognized to be the best; it should be the preferable course in the eyes of the consumer. The main failure of the first wave of marketing ecologist, dating back to the 1990's, was determined precisely by complexity in the product experience. The second bullet point stresses the need to Integrate trade, technology, social, and ecological effects in circular and inclusive perspective. Thirdly, the Innovative aspect is crucial because it allows you to create new products and new lifestyles. A product must stand out as requested, as something that does not involve too many sacrifices; the consumer, in other words, should not perceive as

traumatic any change in their consumption patterns. The last point emphasizes how each choice of consumption should be more informed, more aware, and responsible. Many of these elements are traceable in the Web 2.0 user behavior, as if there were a kind of *Zeitgeist* (spirit of the time), the dominant cultural trends in contemporary times, ethical, intellectual, political and spiritual, which is naturally reflected on the habits purchase and assignment of meaning to those who, in full, you can define the contemporary era prosumers.

The fundamental principles on which green marketing is based have strong similarities with the behavior of users in social networks, in particularly in regards to:

- the importance of the appearing conversational;
- the active participation of users;
- the emotional involvement on multiple dimensions;
- sharing agreement as a value.

If the marketing in the past had as its objective to increase consumption and acquire new business, now seems possible that it proves the need for strategic action that can cause consumers to consume less, that is, in a more sustainable way. This change in perspective has resulted in the discipline of a real revolution that pushed Fabris (2008, *op. cit.*) to argue that the very term marketing should be questioned. The word marketing should be re- placed with the idea that the market is no longer the central element, but rather the company, as evidenced by *Homo Economicus*, like Bauman emphasizing the transition to *Homo Consumes* (Bauman 2007). The sphere of consumption generates a new kind of sociality, new forms of community that are expressed in a polymorphic, in the neo-tribe (Maffesoli, Cova, Ritzer 2006) of that aggregate consumption and through the spaces offered by social networks.

This process is accompanied by so-called "paradox of the bits of the company," according to which a computer becomes more powerful, its di- mensions are reduced, perfectly in line with what is a contemporary rein- terpretation of the ratio of production to consumption, with a view to de- crease (Latouche 2007) or, more simply, to reduce consumption towards greater sustainability of the production cycle.

Today we are witnessing such a "revolution" in the value system that guides the choices of consumers, now that they are past the crisis, will continue on new road taken, well summarized in the now famous saying "a purchase, one vote". Since it is impossible to bring the situation to what it was before the global economic crisis that began in 2008, it is useful to understand the theoretical and philosophical approaches that are subject to a new way of understanding the concept of growth that will prove indispensable for understanding the frame born within which green marketing.

It is in front of a historic challenge: ensuring stability and protecting jobs while maintaining the ecological limits of the planet, and intending to grow in newly appointed ways. A first approach may be that Jackson de- fines ecological macroeconomics. Setting aside the more strictly economic aspects of this theory, we can say that ecological macroeconomics is based on continued growth, but with an extremely low utilization of environmental resources. How is everything? According to the author through an economy that produces and sells "services" dematerialized, non-material products. Not to be confused with an economic system centered on the production of services typical of most developed countries, with production activities as the result of which new growth is to be verified. It is sustainable mobility, reuse, recycle, rent, energy services, and courses without a physical location, to name some examples. Do not

be let off by the fact that you do not know yet the real impact of these activities on growth because it has never experienced an economic situation like that before. Jackson argues that the seeds for promoting ecological macroeconomics are already ingrained in the community: local produce markets, collective energy services, libraries, yoga, gardening, or theater, etc...or any activities to which people – both manufacturers that consumers – draw more wealth and happiness than those properly and frantic materials from which the calculation of GDP derives.

NOTES

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1.4 Integrated vision for sustainable and innovative industrial areas

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1.4.1 Introduction

Throughout the twentieth century, the western world experienced an economic and technological growth, based, mainly, on an unlimited material progress, which aimed at totally satisfying the needs and the quality of life of the human being. However, we have been realizing that the synergetic effects of the implementation of this type of development have resulted in important environmental, social and ecological problems, at a local, regional and global scale. As a matter of fact, the models of spatial and social organization of expansionist theories, together with the population growth and the subsequent rise of the utilization of natural resources, have transformed the earth's surface, have altered the biogeochemical cycles and modified the biological condition of the ecosystems, which have resulted in environmental and ecological problems, such as climate changes and the loss of biological diversity (Vitousek *et al.* 1997) which have a relevant social dimension.

The anthropic activities which have been developed are also disturbing the services which the natural ecosystems offer to the society in terms of flows of materials, energy and information. Considering the scale of the global ecosystem it is thought that we have come to a situation in which the capacity of regeneration and assimilation are at stake (Goodland and Daly, 1996).

This perception is leading to the emergency of new perspectives of development, such as sustainability and resilience, which are turning into more holistic environmental management and political changes, to which the industrial and territorial stakeholders must pay careful attention. These changes demand a integrative thinking which emphasizes intuition, synthesis, holistic and non-linearity, and the associated values are focused on the conservation, cooperation, quality and partnership (Capra, 1996).

With this paper we are going to present these processual and substantive changes and specify the challenges to prevail upon the development of sustainable and innovative industrial areas, based on some results of MER Project - Marketing and Governing Innovative Industrial Areas (2013-2014) cofinanced by the MED Programme, and regarding the visit of the industrial areas of AromaGrasse and Carros-Le Broc (Nice) on 5 of November 2013.

MER Project intends to strong transnational cooperation projects concerning industrial area management and sustainability to build up a European Network to share experiences in the green marketing sector and to identify good practices for sustainable and responsible economic development. This green marketing and sustainable management of industrial parks can be a key factor in attracting investments in the European area.

1.4.2 Dimensions and concept of sustainability

Since the seventies of the nineteenth century, differentiated visions of the territorial development have been established, which go from the support to guided growth by the market and by technology, going through a position which supports the resources conservation management and come to ecopreservationist positions that explicitly refuse the economic growth.

Before such extreme development perspectives, sustainability appears as an ideological alternative, which receives influxes of other currents, but which tries to avoid its excesses, aiming at finding a harmony between the economic development and the conservation of natural resources.

The term “sustainability” appeared, explicitly, at the end of the eighteenth century, in Germany, associated to forest “sustained production”, defended because of the decline of the forest and the perception of the consequences of social instability which from there could derive (Worster, 1993). It portrays the quality of maintenance of something which can continue for indefinite time, like, for example, biological species, ecosystems and the physical environment. It expresses a skill connected with the dynamic balance and with the interdependence between the natural ecosystems and the human ones, leading to its temporal maintenance. Consequently, it deals with a dynamic and evolutive concept, which incorporates a multiplicity of dimensions, all of them inter-related: ecological, environmental, social and cultural, economic, territorial, institutional, political, governmental and individual (Rosa, 2013).

The ecological dimension of sustainability has as aim to keep the natural potential of the earth and of the biosphere represented by the stock of natural resources, atmosphere and hydrosphere, ecosystems and species. The ecosystems should be kept healthy, by preserving its “ecological integrity”, i.e., the capacity of maintenance of the structure and functions of the communities. Consequently, the fundamental result is to maintain the biodiversity to guarantee the integrity, resistance and ecological flexibility, as well as, the systems and functions of support of life, and the maintenance systems of the biochemical cycles. The ecological integrity is associated with the capacity of “resilience” of the ecosystems, which portrays their aptitude to reorganize themselves when faced with a serious perturbation (which alters radically its structure and function) and continue their processes of self-organization.

Before the inducted disturbance by the human activities, the limits of the carrying capacity of the natural ecosystems and the ecological integrity of the global system must be respected.

This ecological dimension is intrinsically related to the environmental dimension which aims at managing the natural resources, so as to satisfy three basic generic lines proposed by Herman Daly (1990):

- Renewable resources should be exploited in a manner such as: a) harvesting rates do not exceed regeneration rates; b) waste emissions do not exceed the renewable assimilative capacity of the local environment;
- Non-renewable resources should be depleted at a rate equal to the rate of creation of renewable substitutes.

One must conserve and improve the basis of the natural resources and of the landscapes stability, conserve and improve the hydric resources, to protect the atmosphere in the regional and world scales, conserve and improve the quality of the local environment.

The need of reducing the dependence of non-renewable resources is stressed, as is the case of fossil fuels.

In this process, it seems to be indispensable to have a climate stability (Goodland and Daly, 1996).

In this environmental context it is fundamental to be aware of the ecosystems services (Millennium Ecosystem Assessment, 2005). These services result in benefits that people and organizations receive from the ecosystems and constitute well-being determinants. For example, including basic materials for a good life (health, good social relationships, security, freedom of choice and action). These are subdivided into four groups:

- Support services – they correspond to the services of the ecosystems which are necessary for the production of all the other services of the ecosystems, which are not directly used by the humans, but which are critical for the maintenance of those; for example, the photosynthesis, the production of oxygen, the formation of the soil, the cycles of the nutrients (carbon, phosphorus, nitrogen), the cycle of the water and of the provision of the inhabitants;
- Production services of food and materials, such as wood and water;
- Regulation services – benefits obtained from the regulation of the processes of the ecosystems; for example, the regulation of the climate, the flood control, the recharge of water aquifers, the maintenance of clean water;
- Cultural services – benefits in terms of leisure, aesthetics and spiritual scope.

In the last fifty years tendencies of great degradation have been registered by many of these ecosystem services, which in a context of sustainability should be restored or conserved.

The ecological and environmental dimensions are intrinsically linked to the economic, institutional and individual dimensions of sustainability.

The economic sustainability has as a goal the potential of production of the societies, which includes the stock production, distribution and transactions of the market. There is the aim of maintaining the regular flows of private and public investments (promoters of stability) and change of patterns of production that will lead to a more efficient management of the productive resources. The production systems should improve with technologies and processes which lead to a more efficient and less utilization of the natural resources and that produce fewer residues.

To face the basic needs of all citizens, one should alienate poverty, by incentivising a “reasonable” rise of the economic growth (especially in the developing regions) and provide a

more balanced distribution of costs and benefits. One must follow principles of solidarity in the distribution of natural wealth. One should give emphasis to the concept of “equity”, understood as a broader way, which goes beyond the equitable distribution of richness (Serageldin, 1993). This is associated to the inherent principles of human rights, to values of justice and of solidarity, to the elimination of discrimination, to the equality of opportunities of access to goods and services, to the access and management of information, to the development of local capacities through the principle of subsidiary, to the shared leadership and to the participation of different groups in decision taking, including minorities. It is then understood the need of having a society with an informed social tissue which is dynamic, participative, capable of awakening a sustainable development to its environment, according to the technologies it has, according to its values, cultures and aspirations.

Sustainability is based upon the domain of the values and upon the cultural identity, whereas its due performance will imply a previous analysis of the ideologies or orientations which shape the mentalities and local conceptions, which reflect life styles.

With the cultural sustainability we aim at respecting the different cultures and their contributions for the construction of models of development appropriate to the characteristics of the communities and ecosystems, which integrate them. It is based on the respect for the endogenous roots of the communities, for the affirmation of the local scale, together with the globalization.

These endogenous and cultural aspects, which empower the local resources and which improve their self-sufficiency, cause the emergence of the territorial dimension of the sustainability, which has as aim the potential of the territory, which constitutes a system of support to all activities. With the territorial cohesion, we are searching for a greater equity in the inter-regional relationships, through new territorial models which detain a more balanced rural-urban configuration and a better territorial distribution of human settlements and of economic activities (Sachs, 1994).

The institutional, political and governmental sustainability has as goal the necessary organizational potential for knowledge, performance, administration and management of the government and of the administrations, being essential for the effective management of the natural, artificial and human resources for the benefit of the total system. This trilogy is linked with the construction of a process of promotion of life quality (which guarantees the safety of all citizens and which safeguards the risk and cares of health) and of a participative democracy. This dimension is fundamental for the promotion of the respect and of the fulfilment of the universal rights of the human being, for the progress of the citizenship and for the resolution of conflicts.

In all this sharing process of responsibilities, one also requires profound changes in the pattern of consumption of the citizens, as well as their participation in the life of the communities and in decision taking. The individual sustainability describes the potential of the actions which enable and lead to attitudes and practices according to sustainability. The involvement of the citizens, in an active way, in the development process, is the key to success.

So, sustainability is the relation between the dynamic human economic systems, and the ecological, also dynamic system, but which normally changes at a slower pace, in which: a) human life can continue indefinitely; b) human individualities can prosper; c) human cultures can develop; but in which: d) the effects of human activities stay within certain limits, so as

not to destroy the diversity, complexity and functions of the ecological system which serves as support to life (Costanza, 1997).

Decurrent from its rising importance, at the beginning of the twenty first century, it emerged as a new scientific area, constituting the Science of Sustainability.

However, new substantive developments occur in these domains. The awareness of the character, mainly anthropocentric of the sustainable development, and the recognized co-evolution which exist between the human and the natural systems, took the academics to defend that the perspective of “sustainability” was overtaken, in the nineties of the twentieth century, by the concept of “resilience” (Leeuw and Aschan-Leygonie, 2000) which determines the importance of change as a means of survival before situations of adversity and which claims for the attention of complexity and diversity of the socio-ecological system.

1.4.3 Toward sustainable territories

In this context of sustainability and resilience, social movements and the academic world have been proclaiming the need of a New Economy, a New Urbanism and a New Mobility.

The movement for a New Economy counts on, presently, with a broad network of organizations, for example, New Economics Foundation, New Economics Institute, New Economy Network, Tellus, New Economy Working Group. They are formulating a new economic theory aimed at the collective well-being, which considers the environmental preservation, the limits of natural resources, the social inequalities and the human well-being, not only from the economic growth point of view (Stephen et al., 2010). They value a territorial approach which enhances the endogenous resources: physical, environmental, cultural, human, economic and financial, institutional and administrative. They assume that such a territorial approach requires a complex, systemic, integrated and global, social change.

The public politics, in force during the twentieth century, paid attention to the approach “predict and provide” the territory with infrastructures, based on measures of supply flexibility which betted on a continuous urban expansion and on water, energy and transport supply systems (according to the studied predictions) through projects of great scale engineering.

In this context of sustainability and resilience one requires changes of substantive tenor, which consider, in a complementary way, demand management measures which aim at managing (reduce or reorganize) certain needs (water, energy, new urban space), instead of just satisfying them.

For example, in the planning and management of the hydric resources, one has paid attention to the “hydraulic paradigm”, which has stressed measures of supply management, through the construction of big dams and water systems. Presently one advocates a “New Culture of the Water” which defends that rivers, lagoons and damp areas cannot simply be considered as mere ducts or deposits of water at the service of the productive systems, but they should be managed as live ecosystems and as collective patrimonies of identity, of natural well-being, beauty and evocation of feelings. Land use managing can contribute to reduce water needs.

The necessary ecosystem approach stresses the need of integration of water management with territorial management and it promotes the rehabilitation of the ecosystem services. They take advantage of the obtained benefits of the regulation of the processes of the ecosystems, as for example, climate regulation, floods control, aquifers recharge and the maintenance of water quality.

These approaches reveal the necessity of developing a holistic approach, which detains a territorial dimension that promotes the instruments of land use planning and an adaptive management of the territory.

In practice, until a fairly recent past, land use planning hasn't been able to configure itself as a preventive instrument of environmental management, but as an instrument of development in a model of social and spatial expansionist organization which tried to find the best localizations for the urban expansion, for industry, for leisure areas, for natural or artificial parks and to implement transportation networks of infrastructures to connect the urban centers. In this process, the territorial managers detained an urbanized vision of the territory.

These territorial models are a legacy of an abundant fossil fuel period which allowed a significant tendency to low demographic densities and a higher physical separation and a dispersion of activities (work, residence, commerce, education and leisure), leading to a broad motorized mobility, which consumed a lot of energy and generated greenhouse emissions, among other impacts.

We must, nowadays, promote urban and mobility systems with low carbon, according to an approach denominated "predict and prevent" (Owens, 1995) in which one predicts a future search for dislocations on road and then one finds ways of avoiding that to happen, through new approach "getting the price right" and influencing travel patterns through land use planning. Reduction of the growth in urban road traffic is generally accepted as an integrated part of sustainable mobility. There is a relatively widespread consensus of which ways are needed in order to reduce urban car traffic volumes: physical and fiscal constraints on road traffic, improvements for public transport (emphasis on train solutions), walking and cycling, urbanism of proximity. This New Mobility is intrinsically connected with sustainable urbanism.

The New Urbanism is a social movement focused on the urban design that considers green and blue urban structures, aesthetic environment, building patrimony, quality of life and promotes Transit Oriented Developments. This assures that the access between residential areas and the stops and stations of public transport are attractive for the pedestrian and for the cyclist, in terms of aesthetics, comfort and safety. The pedestrian is at the top of the access hierarchy (including people with reduced mobility), so that the living quarters become more human places. It promotes urban mixed use, by incentivizing the proximity of the urban services, work places and residential areas. Presently in many urban areas, the environment for the pedestrian is extremely hostile, due to the urban design itself, orientated for the motorcar traffic. In terms of comfort, the ideal is the creation of a network of pedestrian routes, accessible to all, associated to a green and/or urban structure, inviting the citizen to a dislocation on foot.

The New Urbanism promotes the culmination of the urban perimeters with a process of urban regeneration, which consider energetic efficiency strategies, urban ecological improvement,

water strategies, and it also considers, in a preventive way, the natural and technological risks.

1.4.4 Characteristics of sustainable and innovative industrial areas

The Nice Côte d'Azur CCI's Town Planning Cluster was involved in the MER project. A European delegation of 40 members involved on this project was travelling to the Cote d'Azur from 4 to 6 November of 2013 to visit two business areas: the Carros-Le Broc industrial park and the AromaGrasse Cluster.

The visits showed a lot of the best practices on industrial areas sustainable redevelopment, on the supply of innovative and common services based on industrial ecology, marketing, accessibility, cultural patrimony protection, good communication with stakeholders and local authorities.

Nice Cote d'Azur is an excellent example of an intelligent city which is considered a region with a high capacity for learning and innovation, especially built by the creativity of its inhabitants, by the knowledge-creating institutions and by a solid digital infrastructure of communications and knowledge management. This concept is so intrinsically connected to the digital city, translator of digital community spaces that are used to facilitate and to enhance the activities and functions that occur in the physical space of the city. This scan allows a diffusion of knowledge that contributes to the collective creativity.

The innovative smart eco-districts integrate health and wellness, culture, education and life-long learning, as well as the latest technological solutions, with the goal of creating a unique living experience within a green environment.

A Nice Cote d'Azur Smart City Program was developed which has a lot of smart dimensions. In this Program, the energy management is seen as a key part of the development to find a solution to the weakness of the power transmission network and to attract new industries and businesses (Clement, 2013).

The visit of the industrial zone of Carros-Le Broc was focused on the urban requalification, innovative and common management services (energy, waste, industrial waste water), on the development of a workplace mobility plan for enterprises and on the communication and work of the business club with the local authorities. This industrial zone is an example of a smart eco-district as we saw in the Nice Grids showroom.

The organizational capacity of these innovation hubs results from a set of key attributes associated with the development of activities related to the creation and application of knowledge, to attract knowledge workers and to the creation of productive, innovative and competitive clusters. So, it is dependent on the existence of a knowledge base and on an economic base, and it demands quality of life, urban diversity, urban scale, aesthetic values, social equity, connectivity and accessibility.

Concerning energy management, the industrial sector is reducing the dependence of non-renewable resources (ex. fossil fuels) by promoting renewable resources and smart technologies. It attends to the air protection and climate change which require the reduction

of exposure to air pollution, by reducing emissions and it attends to the limits and target values for air quality, through innovation.

The smart grid in industrial and residential areas is an important solution to mitigate future energy challenges. It can improve peak load reduction, load shifting, co-generation/storage, the reduction of costs through energy and operational efficiency, the reduction of greenhouse gases, the optimization of energy consumption, the integration of renewable energy and it promotes sustainable e-mobility charging. This efficacy is related with smart and sustainable buildings that manage optimally local consumption, generation and storage, by providing detailed monitoring.

Figure 1 - Industrial zone of Carros-Le Broc



Photos: Manuela Rosa

A Workplace Mobility Plan was developed for enterprises of Carros - Le Broc that presented a group of measures aimed at aiding and facilitating travel to this area of enterprises encouraging employees, clients and suppliers to use other transport methods beyond individual driving: car sharing, public transport (creating new lines in a collaborative institutional process), cycling, walking, mutual car pools (Stawikowski, 2013).

Concerning integrated waste management this is intended to optimize waste management, to comply with regulations, to preserve natural resources and to strengthen the image of the industrial estate (Misiraca-Teychene, 2013). The success of the measures developed is connected with a strong involvement of the project leader, the support of local and national authorities, the technical assistance to firms to set up actions, the perception of the benefits for firms on environmental and economic issues. At the beginning six materials were targeted (paper, cardboard, plastic film, metals, wood and residuals) and nowadays it was extended to white paper, green waste, humid waste (gaseous waste), construction waste (hazardous and inert) and glass.

This innovative industrial zone of Carros-Le Broc was developed with a strong communication and cooperation among the business club with local authority.

In the visit of the industrial area of AromaGrasse a new industrial development was promoted, integrated in the city, that answers to a request from the aroma industrial sector, the importance of marketing approach and sectorial positioning, and emphasis was given on

the quality of the architecture (landscape and high environmental quality buildings), on the optimization of land and space, and on the active policy of the local authorities.

The old city of Grasse has an important contribution to the history of perfume industry. Due to the rare scents (lavender, myrtle, jasmine, rose, orange flower, wild mimosa) Grasse, in former times, won the title of the world capital of perfume and continues to have a relevant role in this cluster. This cultural identity is considered in the territorial marketing approaches undertaken to increase the economic development of this region.

In this patrimonial context, the urban community of Pôle Azur Provence developed a new industrial park specializing in the sector activities of perfumes, fragrances, cosmetics, pharmaceuticals and biotechnology. Landscaping was an important component of the overall design of this area, contributing to the quality of this industrial park.

The Pépinière d'Entreprises InnovaGrasse was visited which is a business nursery or enterprises incubator where a lot of enterprises in the perfume and cosmetic sector are located, it promotes a network of technological, financial and institutional partners. It is located in the heart of this traditional perfume city, in the newly renovated Roure Bertrand perfume factory (established in 1820) which is a beautiful old structure designed by Gustav Eiffel.

Cultural Heritage protection demands this kind of actions to conserve and maintain the significant or characteristic features of a site, justified by its heritage value, and industrial sector can have an important role in the urban regeneration strategies.

Figure 2 - Industrial area of AromaGrasse



Photos: Manuela Rosa

1.4.5 Final considerations

Nowadays territorial and industrial managers have to integrate social, environmental and economic concerns in their values, culture, decision making, strategies and operation, establishing better practices within their organizations and improving the communities where the industrial areas are integrated. In this process, governance and participation involvement provide extensive know-how and expertise.

MER Project, through a strong governance network, showed a lot of the best practices and perspectives on energy and environmental issues to contribute to the improvement of competitiveness and attractiveness of the industrial sector and regions in the frame of sustainable growth according to the European 2020 Strategy.

This Project identified good practices on territorial marketing and on the development of green marketing tools associated with industrial sustainable management. Emphasis was given on environmental management and on new social innovation processes related with territorial and industrial marketing and governing which demanded a close co-operation among all governmental, industrial and professional interest groups.

An integrated territorial development was perceived. It requires a strong social process of governance to guarantee a continuous cycle of decision making, which deals with the development of territorial, social and environmental policies, with the planning, design and operational phases, and with the implementation of specific projects as a systemic whole.

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NOTES

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Part 2 Major Themes and Topics

2.1 Setting up the Institutional Framework for Eco-Innovative Industrial and Enterprise Zones: The Case of Italy

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2.1.1 Eco-innovative Industrial and enterprise zone: reference concepts

Sustainability is nowadays a key issue for citizens, governments businesses, researchers, and businesses. A recent Unep report defined Green economy as one that “improves human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”. The report claims “that greening not only generates increases in wealth, in particular a gain in ecological commons or natural capital, but also (over a period of six years) produces a higher rate of GDP growth”.

Industrial areas are complex systems, agglomerations of production plants, summing up with potential negative impacts on environmental and local communities. How is it possible to change these systems towards sustainability? Legislation concerning Eco-Innovative Industrial and Enterprise Zones, despite the common background of the European Directives, is quite different in the studied countries and the approach to sustainability is even more heterogeneous. It should be mentioned that despite a law defines an industrial Area in all the countries, a specific law concerning Sustainable Industrial Areas is only present in Italy.

However in last years several experiences and good practices have matured both in Europe and internationally: initiatives developed from bottom-up processes, to meet more restrictive environmental legislations, but also for economic advantages, first of all the always mentioned example of symbiosis network in Kalundborg (for more details see cap. 5.2). The Italian case is rather particular, as there is faced a top-down process: a national law introduced the necessity to spread infrastructure, common services, and a unitary management in order to “ensure the protection of health, safety and environment”.

The following paragraphs present an overview of the current situation of legislative framework and its application in Italy; while a critical assessment and the way forward is also presented.

2.1.2 Italian national directions

At the Italian level, the unitary and sustainable management of the industrial areas is a relatively new issue, as a legislative framework of reference had been lacking until about fifteen years ago and, above all, a cultural fabric capable of assimilating this new conception. On the grounds of the experiences led abroad and the legislative changes on the subject, the Italian manufacturing situation is now changing its approach, evolving towards the application of the principles inspiring Industrial Ecology according to which the industrial area takes on a major role in regard to environmental safeguarding, the valorisation of the territory and entrepreneurial competitiveness. Although 15 are not really few, is evident that eco-mangement in industrial areas cannot be considered as a consolidated tool. However,

Apeas represent a strategic element in policies for industrial and environmental needs of Regions that have addressed this issue.

In Italy the Ecologically Equipped Area (AEA) or Ecologically Equipped Productive Areas (Apea) concept has been introduced by the article 26 of Legislative Decree 112 of 31 March 1998 on *"Contribution of administrative functions and duties of the State to the regions and local authorities in the implementation of Chapter I of the Act of 15 March 1997 n. 59"* (so-called "Bassanini Decree"). The Bassanini law delegates to the Regions the detailed regulation on the ecologically equipped industrial areas but still, it gives some basic reference elements such as the system of unitary management and the infrastructural endowment and the shared services in order to minimise and manage the pressure on the environment in an integrated way.

Article. 26 of L.D. No. 112/1998

Industrial areas and ecologically equipped areas

1. The Regions and the Autonomous Provinces of Trento and Bolzano regulate, with its own laws, industrial areas and ecologically equipped areas, outfitted with the infrastructure and necessary systems to ensure the protection of health, safety and environment. The same laws also govern the forms of joint management of the infrastructure and services of ecologically equipped areas by public or private entities, also established under the provisions of Article No. 12 of the Law of 23 December 1992, n. 498, and Article No. 22 of the Law of 8 June 1990, n. 142, as well as the modality of acquisition of land in industrial areas including, where necessary, by expropriation. The production plants located in ecologically equipped areas are exempt from the acquisition permit covering the use of the services therein.
2. The Regions and Autonomous Provinces identify the areas referred to in paragraph 1 choosing and as a matter of priority the areas, zones or units already existent, even if partially or totally abandoned. the local authorities concerned participate in the identifying procedures.

That concept, which evolved into the one of "Ecologically Equipped Productive Area, referring to the settlements addressed to industrial production which is being referred to in the Bassanini decree, is spreading progressively in some Italian Regions and Provinces. Although it is a question of recently developed applications, it is possible to cite several interesting experiences.

2.1.3 Comparative analysis of Regional regulations



Source:[http://lazio.inu.it/wp-](http://lazio.inu.it/wp-content/uploads/2014/03/Convegno-AIPDP_Brunelli.pdf)

[content/uploads/2014/03/Convegno-AIPDP_Brunelli.pdf](http://lazio.inu.it/wp-content/uploads/2014/03/Convegno-AIPDP_Brunelli.pdf).

In green the 9 Regions which have enacted laws and regulations governing the Apeas, in orange the Friuli Venezia Giulia, with experiences that are close to the model Apea.

As aforementioned, 9 Italian regions have enacted laws and regulations governing the Ecologically Equipped Area (i.e. *Liguria, Piedmont, Toscana, Emilia-Romagna, Marche, Abruzzo, Puglia e Calabria, Sardinia*). Other Regions, do not have specific rules and have delegated indirectly the issue to laws governing the "consortia of industrial development", i.e. structures designed to the unified management of a number of issues common to the Eco-Innovative Industrial and Enterprise Zones, including those of the relationship between industry and environment. Moreover, some Regions, although they have no specific regulations on the Eco-Innovative Industrial and Enterprise Zones or consortia, they make explicit reference within Single Programming Documents, Regional Operational Programmes, Regional Territorial Plans and other regional planning documents.

The main elements characterizing the Apeas are equal in all Regions:

- equipments of quality;
- presence of a sole manager in charge of the management of centralized equipments and services, to realize environmental analysis, environmental improvement program and monitoring system;
- presence of a Environmental Management System (EMS) for the whole area.

Then there is convergence not only in the implementation of the Bassanini Decree, but also to the adoption of an approach proper of EMS, of continuous improvement. A voluntary choice of territories.

In some cases (Marche, Piedmont, Tuscany) is expected to be qualified Apea, in others the status decision is made solely on the basis of planning decisions. The recognition of the qualification can be attributed to different entities: Municipality, Province, Region, accredited certifiers. The planning decisions can be conducted at very different scales: from the municipal to the regional. The performance requirements for Apeas are differently expressed

in various regional regulations: in some cases are presented as objectives to pursue (Emilia-Romagna, Piedmont), while in other as standards to be adopted (Marche, Tuscany). The criteria for the recognition as Apea in the regions for which it is intended, can be managerial (Piedmont), or more addressed to the equipments (Tuscany).

In all regional regulations, the presence of a reference entity for the management of the area (program manager, responsible entity, sole manager, etc., Consortium in the case of Friuli VG) is requested. However the indications relating to the characteristics of the management unit are quite large: it should be public, private or mixed; it should have a corporate form, as a joint stock company, etc. A recurrent indication is to identify an entity representative of the local realities. In some Regions (Emilia-Romagna, Marche, Tuscany) is foreseen the presence of a structure charged to control the management unit, seeing the involvement of local authorities (municipalities and provinces) and, where appropriate, representatives of the business world such as entrepreneurial associations and chambers of commerce.

In many cases regions provided simplifications for businesses settled in the Apeas. Emilia-Romagna, Marche and Tuscany make explicit references to the “sole authorization” under the Bassanini decree, with particular reference to water and waste sector. In Emilia-Romagna and Marche are also planned increases in the size thresholds for the interventions subject to environmental impact assessment within the Apeas.

Relationships with businesses can be adjusted through: tools governing the relations between individual company and the management unit (e.g. conventions, disciplinary); agreements signed by the management unit and a number of undertakings (environmental improvement program for the Apea); regulations applicable to the industrial area; management unit's organizational form (e.g. consortium structure); environmental management system of the area.

Promotional tools most commonly used are: guidelines and technical manuals, experimental projects, incentives. There are 4 main type of support measures adopted for the diffusion of the Apeas: direct funding (for infrastructures, feasibility studies and for the establishment of the management unit); priority in the allocation of public funds, simplifications in administrative processes, tax breaks and abatement of charges.

2.1.4 Apea in Marche Region

The Marche Region, precursor of such experiences at the Italian level, has already been active for several years in the technological and environmental qualification of the productive areas, also as a function of the enhancement of its own territory and in 2005 it published the “Guidelines for the Ecologically Equipped Productive Areas of the Marche Region”. That document, drafted together with the two enclosures “Good Practices for the Environmental Management of Ecologically Equipped Areas” and “The Pilot Cases in the march region”, have represented a point of reference for the subsequent Italian experiences. According to that conception, am Apea must answer precise urban, territorial, building and environmental quality prerequisites and must be endowed with specific forms of management, infrastructure, technological systems and shared services/utilities, as a function of the real needs of the companies settled there, the characteristics of the territory and the area's environmental critical factors, such as to guarantee environmental and economic advantages. Those guidelines have an experimental, not mandatory, character in such a way that, on the

grounds of the experiences matured and the benchmarking with the local bodies and the interested parties, they can be subsequently integrated and progressively applied. The latest version of the Guidelines, enriched by a calculation tools and software, is 2012 (<http://www.ambiente.marche.it/Ambiente/Areeproduttiveecologicamenteattrezzate.aspx>). Their application was tested on an industrial area (ZIPA area Camerano) and on an industrial building (OMES plant, Collegno - Turin), because guidelines envisage a first evaluation phase in the drafting stage of operational urban planning tool, and a second one related to single buildings. Moreover, high attention was paid to the management of these settlements. The Regional Territory Department recently developed a Draft Law on "Regulations for territorial government" foresees to fully repeal the precedent discipline and incorporating it (Chapter V art.30).

2.1.5 Apea in Emilia-Romagna Region

Emilia Romagna Region is working to promote the qualification of enterprises and territorial settlements in its territory through an integrated system of policies (rules for land use planning, environmental and incentives). Emilia-Romagna Region indicates (with Law 20/2000, Art. A-14) that "all areas that are extended in more than one municipality should assume profiles of ecologically equipped areas by Territorial Agreements". In June 2007 the "Regional guiding act for the realization of ecologically equipped areas" has been approved. This act establishes the detailed iter to implement and manage the Apeas, distinguishing between new settlements and rehabilitation for the existing ones. The approach follows the principles of precaution and prevention of pollution and economic development and sustainable production. Emilia-Romagna Region had also allocated substantial finds through the ROP-FESR 2007-2013 for interventions in the Apeas in the energy fields. The economic crisis has slowed investments, and some of these resources were diverted as a consequence of the earthquake, however this incentives have been important instruments for the promotion of greener industrial areas.

Relevant is the experience of the **Province of Bologna** which has included the theme of Apeas in its territorial governance tool – Territorial Plan for Province Coordination since 2004, implementing the following policies in relation to industrial areas:

- no new production settlements in green field;
- extension is allowed in only 14 areas (of 190 existing areas), chosen on the basis of their relevance, their accessibility with respect to the present and future viability, their placement in areas not effected by slope risk and that does not interfere with areas of nature protection;
- this 14 growing areas must become Apeas;
- the planning of this 14 Apeas must be done trough "Territorial Agreement" signed by the municipalities within the large territorial involved and the Province; this act will establish procedures and commitments to qualify environmentally the new settlement, and a fund allocating resources for the rehabilitation of the existing settings.

The Province in these last years has conducted studies and experiments with the aim to promote and realize quality productive settlements in its territory. Particularly, in 2006 there have been elaborated the "Apea Guidelines" with the aim to provide an operational tool for the municipality administration that plan and design the IA. The Province of Bologna has also started concrete paths of qualifications in 5 local areas. In addition, the Province has prepared

studies and tools to support the energy and environmental qualification of its production areas. For further details (in Italian): <http://www.provincia.bologna.it/impresa/Apea>

2.1.6 Apea in Tuscany Region

Regulation no. 74/2009 suggest an innovative and interdisciplinary approach to Apea. Then to facilitate the start-up of Apeas, Tuscany Region propose a document that exhaustively faces all aspects and allows to define the best operating model: "Application of Tuscan Discipline on Apeas: method and case-studies" in 2 volumes (Vol.1: Main features of the new settlement models; Vol.2: Guideline to solutions satisfying Apeas performances criteria). We shall not forget that we are talking of voluntary tool, to be applied where conditions allow to appreciate all advantages. Incentives to these new-generation industrial areas have been subject to an intervention by the regional legislator, first with L.R. 40/2011 (volume increase) and then with L.R. 38/2012 (reduction of authorization terms). In 2010 the APSEA Associations was established: the additional "S" wants to put emphasis on social aspects, being the first case in Italy of an organization founded between public and private subjects to foster the approach and diffuse good practices of this kind of industrial settlement.

2.1.7 Industrial Development Consortia

As already mentioned, the others Italian Regions has not adopted specific legislation on the Ecologically Equipped Productive Areas, however, at present, have laws on "Discipline of industrial development **consortia**" or laws for the development industrial **districts**, which contain several elements in common with the discipline of Ecologically Equipped Productive Areas. For example, consortia and agencies for the development of industrial clusters play a similar role to that of the Unit Manager/Person in charge of the Ecologically Equipped Productive Areas.

The Consortia promote the conditions necessary for the creation and development of productive activities, building and managing infrastructure for industrial activities and promoting business services. Business services include the provision of services for technological innovation, managerial and organizational support for industrial enterprises and service providers. In particular, the Consortium provides:

- the acquisition or expropriation and design of sites for industrial areas, including the promotional campaign for the establishment of productive activities in these areas, the design and construction of infrastructure works and services, as well as equipment of public spaces for collective activities;
- the sale and granting to companies of lots in equipped areas;
- construction in equipped areas of buildings, plants, laboratories for industrial and craft activities, depots and warehouses;
- the sale and leasing to companies of buildings and facilities in equipped areas;
- the construction and operation of sewage treatment plants in production plants, storage of toxic and hazardous waste, as well as the transport of the latter;
- the recovery of existing industrial buildings to their destination for productive purposes;
- the operation and management of facilities for self-production and distribution of electricity and heat.

In addition, the Consortium can promote the provision of services related to:

- technological research, design, testing, acquisition of knowledge and the provision of technical assistance, organizational and market-related technological progress and renewal, as well as advice and assistance to the appropriate diversification of product ranges and their market prospects;
- advice and assistance for the creation of new businesses.

For the achievement of the institutional objectives the Consortia can operate either directly or in collaboration with other public and/or private or promoting or participating in society capital. The consortia shall regulate methods of competition of individual firms established to cover administrative costs and routine maintenance of the infrastructure and facilities made by the same consortium.

2.1.8 Industrial Development Consortia in Friulia Venezia Giulia Region

Friuli Venezia Giulia Region has not adopted specific legislation on the Apea, however, at present, has the law on "Discipline of industrial development consortia" (Regional Law January 18, 1999 n. 3) of the Law "For the development industrial districts "(Regional Law November 11, 1999 n. 27) and the law on" discipline of entity industrial area of Trieste "(Regional Law 1 October 2002 no. 25), which contain several elements in common with the discipline of Apea. For example, consortia and agencies for the development of industrial clusters play a similar role to that of the Unit Manager/Person in charge of the Apea. Under the Regional Law 3/1999 the Consortia promote the conditions necessary for the creation and development of productive activities, building and managing infrastructure for industrial activities and promoting business services. Business services include the provision of services for technological innovation, managerial and organizational support for industrial enterprises and service providers. Consortia realize and manage infrastructures for industrial activities, as well as promoting and managing services in favor of enterprises settled in the area of competence. The law specifies that territorial planning functions are conferred to Consortia inside the limits of industrial areas under their management. Currently the law n. 3/2009 is stopped on new resources allocation; some doubts were raised on the conformity of incentives in favour of economic public bodies on Community provisions on national aids matter. The need is to create a new regional legislation compliant with EU law, but safeguarding Consortia, considering their fundamental role in the promotion of competitiveness of settled enterprises and of regional system attractiveness.

2.1.9 The application of EMAS Regulation in industrial clusters

Another interesting approach which has some valuable applicative experience on the environmental side is the application of **EMAS Regulation** in industrial clusters is possible from 2001, with the first revision of the European Regulation. This opportunity is defined in Decision (EC) n. 681/2001 *on guidance for the implementation of Regulation (EC) No 761/2001 of the European Parliament and of the Council allowing voluntary participation by organisations in a Community eco-management and audit scheme*, today repealed. The guidance gives indications for entities suitable for registration to EMAS. The new Regulation (EC) 1221/2009 on the voluntary participation of organizations in a Community eco-management and audit scheme (EMAS), provides at art. 37 that "Member States shall

encourage local authorities to provide, in participation with industrial associations, chambers of commerce and other concerned parties, specific assistance to clusters of organisations to meet the requirements for registration...". On the basis of these recommendations, the Italian Ecolabel - Ecoaudit Committee issued in 2005 a "Position on the application of EMAS developed in homogeneous production areas".

This position (called position APO) has been reviewed by the Committee in 2007 and 2011 <http://www.isprambiente.gov.it/files/accreditamento/posizionecomitatodistretti-20110222.pdf> (in Italian). It introduces simplifications for enterprises which can use synergistically the EMAS APO path to register themselves to EMAS scheme.

The district approach in Emas and the creation of a Certificate is an innovative proposal from the point of view of local sustainable development policies providing an essential support to individual organizations that want to undertake a path towards sustainability management. In fact, if the simplification procedures proposed were applied jointly in the District, many obstacles would be removed.

The first experiences in the Italian and European environmental management on a regional scale date back to the late nineties. The management subjects which currently have a valid certificate are 9: Chemical and industrial Pole of Ravenna, Furniture District of Livenza, Tannery District of Vicenza, Paper District of Capannori, Chemical and industrial Pole of Ferrara, Tannery District of Solofra, Tourism System of Polesine, Tuscany Tannery District, Paper District of Frosinone.

In this context, the *Livenza District*, which comprises 11 municipalities, 700 companies and 10,000 employees, thanks to the environmental awareness of the individual businesses and the whole territory, started the EMAS certification. Livenza District is an economic and geographical area, which host the most important Italian industrial clusters in the field of wood and furniture. An integrated system of medium and small-medium companies has been developed, which produces sales of 2 billion Euros, one-fourth of the Italian total in the sector.

To date, several companies and the three most representative municipalities of the District are registered to EMAS scheme.

The main environmental achievements of the EMAS APO project were:

- 20% reduction of Volatile Organic Compounds VOC;
- Increased separate collection of waste;
- Improvement of the status of surface waters.

2.1.10 The PON GAS Environment Project

The Ministry for the Environment and Protection of the Territory and Sea manages, with funds by the European Social Fund (ESF), developed a project inserted in the PON GAS (National Operating Programme and System Actions). Action 7A is dedicated to the promotion of sustainable development, with the aim of reinforcing and integrating the environmental governance system inside public administrations of the Convergence Objective (Calabria, Campania, Puglia and Sicily). In this framework in 2012 PON GAS project forecast a report containing a business sector analysis on Apeas application, Guidelines on Apeas development

and EcoAP in Convergence Regions and other Italian Regions. The report was commissioned to Cresme Consulting. Cresme surveyed 3402 industrial areas, highlighted a general delay in current development of European industrial production capacity and efficiency, a serious gap for the non-implementation of innovation paths in land and industrial areas management, and the lack of spread of Apeas on a national scale level, despite recording some excellence (Emilia-Romagna, Tuscany).

The application of Bassanini's law, dealing with “a system of interest, as complex as that of the industrial world, had the disadvantage of not provide specific deadlines for regions and didn't laid down clear criteria to be referenced for the construction of a single model of Apea.

2.1.11 The network Cartesio and the Chart for the Apea development

Cartesio network, is a network of Italian Region aimed ad sustainable management of clusters, territories and collective business systems, funded by Emilia-Romagna Region, Lazio, Liguria, Lombardia, Sardegna and Tuscany, with over 200 member organizations from 18 Italian Regions. The Network is open to all Italian regions and subjects who play a role in the promotion of territorial environmental management. Both public and private entities could join the Network, free of charge. Some examples: Regions, Provinces, Municipalities, park authorities, control authorities, associations of institutions, Ministries, Industry Associations, managers of industrial areas, representatives of districts, research institutes, companies, certification bodies, private companies and freelancers.

Cartesio network promotes innovative projects aimed at driving policies and sustainability tools for enterprises and their relationship with territory and local authorities. The bodies of the Network are:

- the Steering committee, composed of representatives of the Regions. It approve the annual program of activities of the Network and is responsible for planning, organizing and directing the activities of the Network laid down in the annual program;
- the Technical and Scientific Committee, composed of technical experts from regional authorities and experts listed by the Regions. It works to support the Steering Committee in the pursuit of the aims and specific objectives of the Networks and operationally lead the activities provided in the annual program.

Apea is one of the main focuses of the Network. Cartesio promoted the signing of a Chart for the development of Apea in Italy, which commits signatories to work towards the harmonization of languages and criteria, to build a registry of Apea, develop and put into effect administrative simplifications, implement local convergent and mutually policies for the sustainability of productive areas. Nowadays 4 Region had already subscribed it: Emilia-Romagna, Liguria, Sardinia and Tuscany.

The registry could respond both at need to map the areas and benchmarking requests; it could eventually represent a tool for Administrations to direct aids and incentives. The registry could contain the following information: location, dimensions, centralized equipments, management, common services, simplifications and aids. A registry allows to pinpoint a “zero moment”, from which the area is formally recognized as Apea.

2.1.12 A critical assessment of the policies for Ecologically equipped productive areas (Apeas)' development and the way forward

Although 15 years elapsed since the introduction of Apeas, they cannot be considered a consolidated tool. The economic crisis has certainly contributed to slow down the implementation of the Apeas, as a result of the stop suffered from almost all investments. These years has not represented an easy moment for the settlement of new industrial sites, or for the renovation of the existing ones. However many stakeholders showed their interest and are working on this issue. Also thanks to the latest public funding and to pilot projects, it was possible to test a fair number of significant experiences. Based on these experiences we can draw some remarks:

- IA in Italian Regions are very different among them: for dimensions, morphological conditions, locations, types of firms located, local opportunities, ...; flexibility in the Apeas implementation is very important.
- Where there is a regulation on the Apeas, this is very structured, giving a strong support in the planning phases. However this generates rigidity in the implementation. Moreover it is necessary to develop support instruments not only for the initial phase of settlement, but also for the life-long management.
- Territorial marketing could be a key toll for the success of Apeas, to attract investors and to give value to local green production.
- Eco-managed industrial and business estates could contribute significantly for a virtuous exit from the economic crises, both for the investments required and for their potential capability of creating advantages for enterprises settled (e.g. economies of scale, reduction of administrative loads, thanks to the services provided by the Sole Manager of the area).
- Comparison and clearness of Apeas features represent important transparency factors for citizens and economic operators.

The analysed initiatives are often recent, so many processes are in progress and should achieve significant results in the medium period. In coming years, it will also be increasingly important to focus on the redevelopment of existing areas and brownfields: the problem of land use cannot be ignored. In addition, as a result of the economic crisis many areas remained empty. Promoting a green regeneration, and providing innovative and high value-added services, means to improve the attractiveness and competitiveness of these territories.

NOTES

1. ENEA
2. ENEA
3. Informest
4. Province of Bologna

2.2 Sustainable Management of Industrial and Enterprise Zones

2.2.1 Introduction

Up-to-date information reveals that all the areas which adopted some good practice such as centralized infrastructures and innovative services have a **Managing Company** (MC) which, depending on the area and country, has different functions and dimensions. If the Managing Company is composed by private organizations, the presence of a **Local Committee** (LC), which joins representatives of both Local Authorities and the enterprises, can ensure that the public interest is represented and that Public Authorities are involved in developing the industrial policy of the IA. If present, the LC collaborates directly with the MC providing its support for the application of Sustainable Management of Industrial and Enterprise Zones. The Local Committee is not necessary in case the Managing Company is a mixed private/public organization

Another important element for the Sustainable Management of Industrial and Enterprise Zones is an **advisory forum** organized and coordinated by the Managing Company, which should be composed by representatives of the companies, Local Authorities, category associations and general stakeholders. The forum allows to gather the stakeholders point of view on the most critical aspects of the management of an industrial area such as the identification of the weak points and the improvement actions. One of the main functions of the Forum is to prevent conflicts with local stakeholders, managing the critical problems, sharing information on the area development policy and improving the area image.

In addition, the implementation of an **Environmental Management System**, either ISO 14001, EMAS or other, including country specific environmental management systems such as those presented in the previous chapter for Italy, is considered an asset.

2.2.2 Managing Company (MC)

Rovena PREKA^[1]

The Managing Company (MC) must have a recognized legal form. It has to represent the enterprises and it should also be recognized by the public system. The Managing Company defines the operating rules of the industrial area and guarantees their implementation. It ensures, through defined procedures, the exchange of information among settled enterprises. It also acts as interface with the Local Authorities and stakeholders.

Generally, the managing company is either public or private, and in most of the cases, it is also a mixed private and public one. The MC offers very diverse environmental and social services to the areas and the settled companies. Moreover, in all cases the MC does not have a coercive function or sanctioning power so it is impossible for these organizations to impose norms or other to the enterprises.

The industrial area by its Managing Company should implement at least a non-formalized environmental management system through the following steps:

- define the area policy and the macro objectives of sustainability;

- analyze the environmental aspects and point out the significant ones (environmental analysis of the area);
- define a shared improvement plan;
- implement a system to monitor the environmental performance of the area;
- define the procedures for the internal/external communication.

The Managing Company represents the fulcrum around which the Sustainable Management of Industrial and Enterprise Zones rotates and that concomitantly embraces many aspects, amongst which the productive area's environmental performances; the economic advantages, thanks to the economies of scale, achievable by using the centralized infrastructures and services; the safeguarding of workers' health and the surrounding communities; the chance for companies to access simplified administrative procedures.

In identifying the organization capable to playing the role of Managing Company, we cannot overlook the essential benchmark with the institutional parties and the economic-social components. It is indeed extremely difficult, at least in countries such as Italy, to imagine an actor that had all the competencies for managing the multifarious aspects that concern a productive area. A critical role is thus entrusted to the table for the sharing and the benchmarking as represented by Local Committee.

In defining the organizational structure of the Managing Body, it is important to lay the stress not just on its juridical nature, but also on the powers attributed to it, without which it is hard to achieve a Sustainable Management of Industrial and Enterprise Zones.

The characteristics of the productive area's management structure may differ depending on whether the area must be developed from scratch or whether it already exists, with activities already settled there. In the former case, the Managing Body will have to set the rules for the settlement and will have to make it appealing and economically advantageous for companies to set up business there. Otherwise, in the cases of reconversion of the existing productive areas, the involvement of the companies settled there will be more complex within a policy of environmental and social improvement.

Each life-phase of the productive area corresponds with specific tasks that have to be dealt with by the Managing Body. In the event that the Manager does not have specific technical capacities, it can make use of third parties possessing such requisites, but maintaining the responsibility for the actions and the definition of the characteristics and the objectives that the outsourced infrastructures or the services must achieve.

The MC by means of the enforcement of its own powers and the fulfillment of its own tasks must be able to pursue the area's sustainability objectives, and in particular:

- reduce environmental impacts caused by the industries concentration
- reduce the industrial settlements dispersion in the territory;
- sustain industrial development by means of optimized transport networks for goods and people and also for local resources handling
- aggregate the demand of the technological innovation and transfer related to environmental, energy and water resources.

Critical factors for Sustainable Management of Industrial and Enterprise Zones

Multifarious interests present within the productive area; the internal and external area that have interests in the area are bearers of demands and values that are often divergent, so much so as to represent an impediment to the identification of a structure that will deal with an eco-efficient management at the level of the productive site.

Difficult interaction between the private and public component: it is necessary to make an effort at the coordination and achievement of an equilibrium accepted and shared by the various parties.

Scarce aptitude from the companies to act and related with each other inside a “system.” This critical element is typical of the productive fabric that until now has developed beyond the logic of collaboration and cooperation among the companies settled in the same industrial area; each company is a “microcosm” unto itself that operates by reducing the interactions with the outside to a minimum.

2.2.3 Local Committee (LC)

Mario TARANTINI^[2]

The LC is an organism whose Managing Company can coordinate the area policies with those of the local bodies of reference. The LC sees the participation of bodies and organisations that have direct administrative responsibilities in the territorial planning or in the management of area services or infrastructures or in checking the compliance with the legal requirements.

The LC plays a very important role in the phase of promotion and start-up of the industrial activities and for the identification and establishment of the Managing Company. Among the chief role assigned to the Local Committee is that of providing support and assistance to the Managing Body in the activities of participation and sharing towards other interest-bearers and to foster the exchange of information relevant to the management of the sustainable productive area and the implementation of the policies of improvement.

The LC must as far as possible be a lean organism capable of performing its activities efficaciously and efficiently.

The LC has the fundamental task of fostering the reduction and the overcoming of the fragmentary nature of the environmental, social and economic information, the identification of the synergies existing between the different actors, the integration of the significant information to foster the implementation of the improvement actions.

It is important to guarantee the presence within the Local Committee of the leading actors capable of contributing to the implementation of the actions for the improvement of the sustainable productive area. The presence in the same organism of the Managing Body, the companies that provide area services and the Local Authorities that are often stakeholders in the same companies, can indeed facilitate the implementation of the decisions taken at the level of improvement.

The Local Committee can be perceived as a redundant organism in respect to the normal relations between Managing Company and the Local Authorities for the territory's governance aspects.

There is the need to have a greater correlation between the decisions taken by the LC and the authorization procedure needed for their actual enforcement. The approval of such actions in the LC should guarantee a fast-track in the Local Authorities of reference for their authorization.

2.2.4 Advisory forum

Alessio di PAOLO^[3], Maria LITIDO^[4]

The Sustainable Management of Industrial and Enterprise Zones should take advantage of the shared and participated processes that become concrete in the establishment of a advisory Forum. Participation represents a crucial factor for the best management and development of the sustainable industrial area, the sharing of the actions and the objectives for improvement, as well as for obtaining opinions in regard to the intervention priorities.

The Forum, made up of representatives from the companies, the local authorities, trades associations, non-governmental organizations, etc. is coordinated by the MC, who benefits from the support of the Local Committee.

The aim of the Forum is to guarantee the active and systematic involvement of all the representative actors of the local system of reference affected by the activity of the industrial area which, through their own actions, interact with the policies and the processes for its sustainability.

The first step for the establishment of the Forum consists in summoning the future participants. All the activities and the choices made by the Managing Company must comply with the principles of equilibrium and fair representation between the actors involved. hence, two types of summons will be adopted: selective and voluntary.

The first methodology, defined "selective", consists in defining a list of interest-bearers who it is believed ought to take part in the Forum so that it will result to be balanced and really representative. The second methodology, defined as "voluntary", instead consists in allowing for a period in which to collect spontaneous candidatures for participation in the Forum.

The involvement of such categories will extend across the whole territory affected by the presence of the industrial area (municipalities where the industrial area is situated and possibly the outlying municipalities). The consultation process, as a whole, will be oriented to the constitution of a development scenario. The scenario represents the picture of reference for the construction of the actions for improvement and management of the productive area.

The identification of non-coherent scenario, or the scarce participation of the subjects involved in the forum, constitutes the major critical factor in the application of the element "Advisory forum".

2.2.5 Industry benefits by implementing ISO 14001 Environmental Management

Marios MAVROYIANNOS^[5]

Environmental management may have begun as a market trend, but today is considered more than a necessity. Finite global resources constantly depleting, scarcity of valuable resources leading to conflicts, global warming resulting to climatic changes, environmental refugees and a vast other effects caused by non-sustainable use of resources by man-generated activities, have endangered our future on the “big blue”. ISO, recognizing the need for a global management of the environmental impacts of every man-generated activity, answered by issuing the International Standard, ISO 14001 “Environmental Management Systems”. This International Standard specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and information about significant environmental aspects. The overall aim of the standard is to support environmental protection and prevention of pollution in balance with socio-economic needs.

The philosophy is simple and fully integrated with other management systems; identify the environmental aspects of your activities and assess their importance; identify legal requirements; set objectives, responsibilities and allocate necessary resources; monitor and evaluate objectives and compliance. The question is whether the implementation of the standard has been actually helpful for businesses and industry, and the environment itself. The answer is definitely a “yes”! After almost two decades of implementing ISO 14001, industries admit that they have achieved:

- Legislative awareness and compliance
- Reduced cost of waste management
- Savings in consumption of energy and materials
- Lower distribution costs
- Improved corporate image among regulators, customers and the public
- Growth of access to business partners and potential customers
- Protection of the company, assets and shareholders
- Environmental culture among employees and society as a whole

Furthermore, these achievements allow industries to keep business running in times of financial crisis, while others perish. The effective use of resources reduces operational costs, allowing maximization of profits during prosperous economic periods. These can only prove that “investing” in environment has also positive economic effects, although the higher aim is the protection of the environment.

In addition to direct financial and environmental benefits, according to Harvard Business Review, moving towards a “greener” economy, new job opportunities and industries are created. Environmental management can serve as a catalyst for innovation, creation of new

markets and wealth. In 2014, almost \$214bn were invested globally in renewable energy creating only in the US 80 000 new jobs in the same year.

The arrogant abuse of the planet's limited resources is at least self-destructive. The limits have been set by nature and it's time for mankind to adapt, in order to survive. Standards like ISO 14001 can assist in harmonizing practices to achieve global management of resources and ensure our future.

2.2.6 Eco-Management and Audit Scheme (EMAS)

Natalia GEORGIOU^[6]

The Eco-Management and Audit Scheme (EMAS) is a voluntary environmental management instrument, which was developed in 1993 by the European Commission. It enables organizations to assess, manage and continuously improve their environmental performance. The scheme is globally applicable and open to all types of private and public organizations. In order to register with EMAS, organizations must meet the requirements of the EU EMAS-Regulation 1221/2009.

Currently, more than 4,500 organizations and approximately 8,150 sites are EMAS registered worldwide aiming to:

- Improve their environmental and financial performance;
- Communicate their environmental achievements to stakeholders and society in general.

The external and independent nature of the EMAS registration process (Competent Bodies, Accreditation/Licensing Bodies and environmental verifiers under the control of the EU Member States) ensures the credibility and reliability of the scheme. This includes both the actions taken by an organization to continuously improve its environmental performance, and the organization's disclosure of information to the public through the environmental statement.

Providing publicly available information on an organization's environmental performance is an important aspect of the scheme's objective. It is achieved externally through the environmental statement and within the organization through the active involvement of employees in the implementation of the scheme.

The EMAS logo, can be displayed on (inter alia) letterheads, adverts for products, activities, and services, and is an attractive visual tool which demonstrates an organization's commitment to improving its environmental performance and indicates the reliability of the information provided. To receive EMAS registration an organization must comply with the following steps:

- Conduct an environmental review considering all environmental aspects of the organisation's activities, products and services, methods to assess these, relevant legal and regulatory framework and existing environmental management practices and procedures.

- Adopt an environmental policy containing commitment both to comply with all relevant environmental legislation and to achieve continuous improvements in environmental performance.
- Develop an environmental programme that contains information on specific environmental objectives and targets.
- Based on the results of the review, establish an effective environmental management system (EMS) aimed at achieving the organization's environmental policy and at improving the environmental performance continually.
- Carry out an environmental audit assessing in particular the management system in place and conformity with the organisation's policy and programme as well as compliance with relevant environmental regulatory requirements.
- Provide an environmental statement of its environmental performance which lays down the results achieved against the environmental objectives and the future steps to be undertaken in order to continuously improve the organisation's environmental performance.
- The environmental review, EMS, audit procedure and the environmental statement must be approved by an accredited environmental verifier.
- The validated statement needs to be sent to the EMAS Competent Body for registration and made publicly available before an organisation can use the EMAS logo.

Benefits of EMAS are:

- Increased efficiency savings;
- Reduced negative incidents; and
- Improved stakeholder relationships.

NOTES

1. ENEA
2. ENEA
3. ENEA
4. ENEA
5. Cyprus Organisation for Standardisation
6. Department of Environment, Ministry of Agriculture, Natural Resources and Environment of Cyprus

2.3 Environmentally Sustainable Infrastructures

2.3.1 Introduction

Maria-Anna SEGRETO^[1]

Adequate services and infrastructures' development is significant for the introduction of environmental dimension in an industrial area's operation. The needs of the companies settled must be assessed prior to the development of an area's services and infrastructures. Moreover, the development potential of the area should be properly envisaged. In fact, identifying a minimal infrastructural endowment à priori is a critical success factor and should be properly addressed. Best available technologies should also be used for infrastructures.

The possibility of exploiting economies of scale through the development of common services and infrastructures should be investigated. During the period of planning and design of both services and infrastructures, the environmental, economic and social aspects should also be considered in an integrated manner. It is also important that plants themselves are equipped with state-of-the-art technologies, in order for them to be able to properly operate and fully exploit the advantages of relevant services and infrastructures.

Services and infrastructures development and operation can be managed directly by a Managing Authority or through third parties; in this latter case, the Managing Authority should be able to ensure the quality of the delivered services and infrastructures. It is also of great significance that the Managing Authority cooperates with local authorities and that its planning is in alignment with local authorities planning for the wider territory.

Other factors that should be regarded as critical for the development of environmentally sustainable infrastructures and services are the cost, the authorization procedure that in some cases is very time consuming, as well as the natural diffidence of the companies towards the use of shared services and infrastructures. In the following table some examples of environmentally sustainable infrastructures for industrial areas are being presented.

Environmental aspects	Infrastructures/area services	Environmental advantages
Water	Plants for recycling of discharged water	Recycling of discharged water and its reuse for industrial and fire purposes
	Rainwater collection	Saving drinking water
	Depuration plant run by the Managing Authority of the area	
Energy	Plant for the production of electricity by means of biomass and tele-heating	Reduction in the climate-changing emissions and economic advantages for the companies
	Illumination plant with photocell	Reduction in climate-changing emissions and economic advantages

	panels	for the companies
Waste	Door-to-door collection	Increasing recycling rates
	Multi-materials	Increasing recycling rates

2.3.2 An Example of Environmentally Sustainable Infrastructures: Industrial Waste Management

Konstantinos KONSTANTINOU^[2], Iakovos SARIGIANNIS^[3]

2.3.2.1 Introduction

Wastes from industries include solid wastes, air pollutants, and wastewaters. These separate categories of wastes are regulated by separate and distinct bodies of laws and regulations. However, the three categories of wastes are closely interrelated, both as they impact the environment and as they are generated and managed by individual industrial facilities. As examples, certain solid wastes handling, treatment, and disposal facilities are themselves generators of both air discharges and waste-waters.

The total spectrum of industrial wastes, then, must be managed as a system of interrelated activities and substances. Materials' balance must be tracked and overall cost effectiveness must be kept in focus. Moreover, the principles of pollution prevention must be implemented to the most complete extent possible. All wastes must be viewed as potential resources.

In some cases, wastes can be used as raw materials for additional products, either on site or at other industrial facilities. In other cases, wastes can be used as treatment media for other wastes. In all cases, the generation of wastes must be minimized by employment of scrupulous housekeeping; aggressive preventive maintenance; substitution of nonhazardous substances for hazardous substances; and prudent replacement of old, inefficient process technology with technology that results in generation of less pollutants.

2.3.2.2 Waste classification

Industrial waste is a subset of waste and is defined as waste generated by manufacturing or industrial processes. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: electric power generation; fertilizer or agricultural chemicals; food and related products or by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing or foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. Industrial waste does not include mining waste or oil and gas production waste. Most of these wastes are in the form of wastewaters (97%).

Specifically the main categories of industrial waste are the following:

- Wastewater,
- Air discharges and
- Solid wastes.

There is some overlap of physical characteristics of the substances contained in each of these three classifications because:

- Wastewater can contain dissolved gases and suspended and settleable solids
- Air discharges can contain vaporized liquids, liquids in the aerosol state, and solid particles known as particulate emissions
- Solid waste streams can include containers of compressed gases, and/or liquids

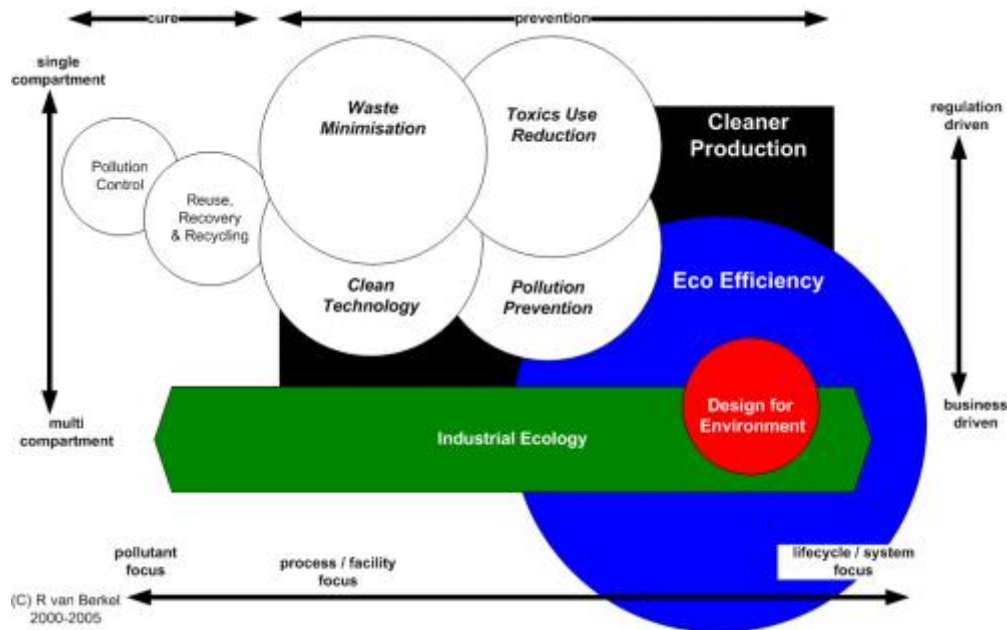
The basis of the classification is the environmental medium to which the waste is discharged, and the characterization of the waste is normally based on the body of laws and regulations that govern that medium.

2.3.2.2 Cleaner Production (CP)

Cleaner production is a preventive, company-specific environmental protection initiative. It is intended to minimize waste and emissions and maximize product output. By analysing the flow of materials and energy in a company, one tries to identify options to minimize waste and emissions out of industrial processes through source reduction strategies. Improvements of organisation and technology help to reduce or suggest better choices in use of materials and energy, and to avoid waste, waste water generation, and gaseous emissions, and also waste heat and noise.

The concept was developed during the preparation of the Rio Summit as a programme of UNEP (United Nations Environmental Programme) and UNIDO (United Nations Industrial Development Organization) under the leadership of Jacqueline Aloisi de Larderel, the former Assistant Executive The United Nations Environment Programme developed in 1991 the following CP definition that is still commonly used:

“CP is the continuous application of an integrated preventative environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment”.



Cleaner production requires changing attitudes, responsible environmental management and evaluating technology options. The Benefits of cleaner production are:

- Economic benefits include increased profits; improved marketability; lower expenditure on materials and resources; additional sources of income; increased quality and greater productivity; better customer service; and increased goodwill from being seen as a responsible member of the community.
- Environmental benefits include less pollution; reduced production of waste; more efficient use of resources; less waste going to landfill; and less effluent to sewage or discharges to water bodies.

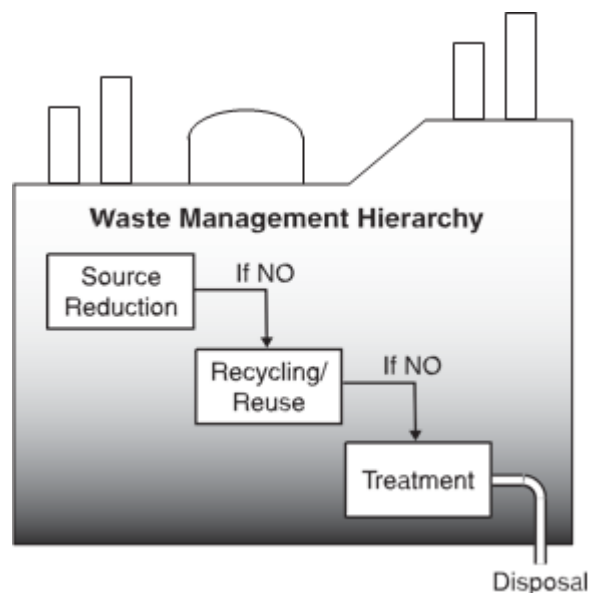
Several complementary CP techniques or practices are possible, ranging from low or even no cost solutions to high investment, advanced clean technologies. A common distinction for CP implementation in developing countries is:

1. **Good Housekeeping:** appropriate provisions to prevent leaks and spills and to achieve proper, standardized operation and maintenance procedures and practices;
2. **Input Material Change:** replacement of hazardous or non-renewable inputs by less hazardous or renewable materials or by materials with a longer service life-time;
3. **Better Process Control:** modification of the working procedures, machine instructions and process record keeping for operating the processes at higher efficiency and lower rates of waste and emission generation;
4. **Equipment Modification:** modification of the production equipment so as to run the processes at higher efficiency and lower rates of waste and emission generation;
5. **Technology Change:** replacement of the technology, processing sequence and/or synthesis pathway in order to minimize the rates of waste and emission generation during production;

6. **On-Site Recovery/Reuse:** reuse of the wasted materials in the same process or for another useful application within the company;
7. **Production of Useful By-Products:** transformation of previously discarded wastes into materials that can be reused or recycled for another application outside the company; and
8. **Product Modification:** modification of product characteristics in order to minimize the environmental impacts of the product during or after its use (disposal) or to minimize the environmental impacts of its production.

2.3.2.4 Industrial Waste Management

Similarly to municipal solid waste, it is strongly recommended considering pollution prevention options when designing an industrial waste management system. Pollution prevention will reduce waste disposal needs and can minimize impacts across all environmental media. Pollution prevention can also reduce the volume and toxicity of waste. Lastly, pollution prevention can ease some of the burdens, risks, and liabilities of waste management. A hierarchical approach is recommended to industrial waste management: first, prevent or reduce waste at the point of generation (source reduction); second, recycle or reuse waste materials; third, treat waste; and finally, dispose of remaining waste in an environmentally protective manner.



There are many benefits of pollution prevention activities, including protecting human health and the environment, cost savings, simpler design and operating conditions, improved worker safety, lower liability, higher product quality, and improved community relations. When implementing pollution prevention, industrial facilities should consider a combination of options that best fits the facility and its products. There are a number of steps common to implementing any facility-wide pollution prevention effort. An essential starting point is to make a clear commitment to identifying and taking advantage of pollution prevention opportunities.

Facilities should seek the participation of interested partners, develop a policy statement committing the industrial operation to pollution prevention, and organize a team to take

responsibility for it. As a next step, facilities should conduct a thorough pollution prevention opportunity assessment. Such an assessment will help set priorities according to which options are the most promising. Another feature common to many pollution prevention programs is measuring the program's progress. The actual pollution prevention practices implemented are the core of a program. The following sections give a brief overview of these core activities: source reduction, recycling, and treatment.

Waste characterization is a key component of a pollution prevention opportunity assessment. An opportunity assessment, however, is more comprehensive since it also covers material inputs, production processes, operating practices, and potentially other areas such as inventory control. When characterizing a waste, consider expanding the opportunity assessment to cover these aspects of the business. An opportunity assessment can help identify the most efficient, cost-effective, and environmentally friendly combination of options, especially when planning new products, new or changed waste management practices, or facility expansions.

Each solid waste stream should undergo characterization in order to determine the following:

- Opportunities for waste reduction
- Rate of waste generation
- Whether or not the waste is hazardous
- Suitability of the waste for landfilling
- Physical properties as they relate to suitability for landfilling
- Chemical properties as they relate to suitability for landfilling
- Estimation of leachate characteristics
- Suitability of the waste for incineration
- Estimated characteristics of stack emissions
- Estimated requirement for auxiliary fuel
- Estimated characteristics of ash
- Suitability of the waste for composting

Source Reduction

Source Reduction means any practice which (i) reduces the amount of any substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment, prior to recycling, treatment, or disposal; and (ii) reduces the risks to public health and the environment associated with the release of such substances, pollutants, or contaminants. Source reduction is the design, manufacture, and use of products in a way that reduces the quantity and toxicity of waste produced when the products reach the end of their useful lives. Source reduction activities for industrial waste include:

- equipment or technology modifications
- process or procedure modifications
- reformulations or redesign of products
- substitution of less-noxious product materials and
- improvements in housekeeping, maintenance, training, or inventory control.

One source reduction option is to reformulate or redesign industrial products and processes to incorporate materials more likely to produce lower-risk wastes. Some of the most common practices include eliminating metals from inks, dyes, and paints; reformulating paints, inks,

and adhesives to eliminate synthetic organic solvents; and replacing chemical-based cleaning solvents with water-based or citrus-based products.

Newer process technologies often include better waste reduction features than older ones. For industrial processes that predate consideration of waste and risk reduction, adopting new procedures or upgrading equipment can reduce waste volume, toxicity, and management costs. Some examples include redesigning equipment to cut losses during batch changes or during cleaning and maintenance, changing to mechanical cleaning devices to avoid solvent use, and installing more energy and material efficient equipment.

Managing Nonhazardous Solid Waste

In-process recycling involves the reuse of materials, such as cutting scraps, as inputs to the same process from which they came, or uses them in other processes or for other uses in the facility. This furthers waste reduction goals by reducing the need for treatment or disposal and by conserving energy and resources. A common example of in-process recycling is the reuse of wastewater. Some of the easiest, most cost-effective, and most widely used waste reduction techniques are simple improvements in housekeeping. Accidents and spills generate avoidable disposal hazards and expenses. They are less likely to occur in clean, neatly organized facilities. Good housekeeping techniques that reduce the likelihood of accidents and spills include training employees to manage waste and materials properly; keeping aisles wide and free of obstructions; clearly labeling containers with content, handling, storage, expiration, and health and safety information; spacing stored materials to allow easy access; surrounding storage areas with containment berms to control leaks or spills; and segregating stored materials to avoid cross-contamination, mixing of incompatible materials, and unwanted reactions.

Recycling

Recycling requires an examination of waste streams and production processes to identify opportunities. Recycling and beneficially reusing wastes can help reduce disposal costs, while using or reusing recycled materials as substitutes for feedstocks can reduce raw materials costs. Materials exchange programs can assist in finding uses for recycled materials and in identifying effective substitutes for raw materials. Recycling not only helps reduce the overall amount of waste sent for disposal, but also helps conserve natural resources by replacing the need for virgin materials. Industry can benefit from recycling: the separation and collection of byproduct materials, their subsequent transformation or remanufacture into usable or marketable products or materials, and the purchase of products made from recyclable materials.

Many local governments and states have established materials exchange programs to facilitate transactions between generators of byproduct materials and industries that can recycle wastes as raw materials. Materials exchanges are an effective and inexpensive way to find new users and uses for a byproduct material.

Recycling can involve substituting industrial by-products for another material with similar properties which is a component of sustainable materials management. For example, using wastewaters and sludges as soil amendments and using foundry sand in asphalt, concrete, and roadbed construction conserves natural resources. The industrial byproducts replace other, virgin materials, such as fill or Portland cement, not only avoiding disposal costs but also

yielding a quality product. State regulatory agencies may require advance approval of planned recycling activities and may require testing of the materials to be recycled. Others may pre-designate certain by-products for recycling, as long as the required analyses are completed. Generally, regulatory agencies want to ensure that industrial byproducts are beneficially used in a safe manner and do not pose a greater risk than the materials they are replacing. Industrial facilities should consult with the state agency for criteria and regulations governing the recycling of industrial byproducts prior to any use or application.

Treatment

Treatment of nonhazardous industrial waste is not a federal requirement. However, it can help to reduce the volume and toxicity of waste prior to disposal. Treatment can also make a waste amenable for reuse or recycling. Consequently, a facility managing nonhazardous industrial waste might elect to apply treatment. For example, treatment might be employed to address volatile organic compound (VOC) emissions from a waste management unit, or a facility might elect to treat a waste so that a less stringent waste management system design could be used. Treatment involves changing a waste's physical, chemical, or biological character or composition through designed techniques or processes. There are three primary categories of treatment – physical, chemical, and biological.

Physical treatment involves changing the waste's physical properties such as its size, shape, density, or state (i.e., gas, liquid, solid). Physical treatment does not change a waste's chemical composition. One form of physical treatment, immobilization, involves encapsulating waste in other materials, such as plastic, resin, or cement, to prevent constituents from volatilizing or leaching. Listed below are a few examples of physical treatment:

- Immobilization, including encapsulation and thermoplastic binding
- Carbon absorption, including granular activated carbon and powdered activated carbon
- Distillation, including batch distillation, fractionation, thin film extraction, steam stripping, thermal drying, and filtration
- Evaporation/volatilization
- Grinding
- Shredding
- Compacting
- Solidification/addition of absorbent material.

Chemical treatment involves altering a waste's chemical composition, structure, and properties through chemical reactions. Chemical treatment can consist of mixing the waste with other materials (reagents), heating the waste to high temperatures, or a combination of both. Through chemical treatment, waste constituents can be recovered or destroyed.

Listed below are a few examples of chemical treatment:

- Neutralization
- Oxidation
- Reduction
- Precipitation
- Acid leaching
- Ion exchange

- Incineration
- Thermal desorption
- Stabilization
- Vitrification
- Extraction, including solvent extraction and critical extraction
- High temperature metal recovery.

Biological treatment can be divided into two categories—aerobic and anaerobic. Aerobic biological treatment uses oxygen-requiring microorganisms to decompose organic and non-metallic constituents into carbon dioxide, water, nitrates, sulfates, simpler organic products, and cellular biomass (i.e., cellular growth and reproduction). Anaerobic biological treatment uses microorganisms, in the absence of oxygen, to transform organic constituents and nitrogen-containing compounds into oxygen and methane gas (CH₄). Anaerobic biological treatment typically is performed in an enclosed digester unit. The range of treatment methods from which to choose is as diverse as the range of wastes to be treated. More advanced treatment will generally be more expensive, but by reducing the quantity and risk level of the waste, costs might be reduced in the long run. Savings could come from not only lower disposal costs, but also lower closure and post-closure care costs. Treatment and post-treatment waste management methods can be selected to minimize both total cost and environmental impact, keeping in mind that treatment residuals, such as sludges, are wastes themselves that will need to be managed.

Landfilling-Disposal

As with municipal solid waste, industrial facilities will not be able to manage all of their industrial waste by source reduction, recycling, and treatment. Landfilling is the least desirable option and should be implemented as part of a comprehensive waste management system.

Implementing a waste management system that achieves protective environmental operations requires incorporating performance monitoring and measurement of progress towards environmental goals. An effective waste management system can help ensure proper operation of the many interrelated systems on which a unit depends for waste containment, leachate management, and other important functions. If the elements of an industrial waste landfill are not regularly inspected, maintained, improved, and evaluated for efficiency, even the best designed unit might not operate efficiently. Implementing an effective waste management system can also reduce long- and short-term costs, protect workers and local communities, and maintain good community relations. Industrial waste landfills can face opposition as a result of concerns about possible negative aesthetic impact and potential health risks.

2.3.2.5 Operating a waste management system

Implementing a waste management system that achieves protective environmental operations requires incorporating performance monitoring and measurement of progress towards environmental goals. An effective waste management system can help ensure proper operation of the many interrelated systems on which a unit depends for waste containment, leachate management, and other important functions. If the elements of an overall waste management system are not regularly inspected, maintained, improved, and evaluated for

efficiency, even the best- designed unit might not operate efficiently. Implementing an effective waste management system can also reduce long- and short-term costs, protect workers and local communities, and maintain good community relations.

Effective operation is important for environmental protection, and for reasons of economy, efficiency, and aesthetics. Operating control systems, therefore, should be developed and maintained by the facility operator to ensure efficient and protective operation of a waste management system. These controls consist of the operator conducting frequent inspections, performing routine maintenance, reporting inspection results, and making necessary improvements to keep the system functioning.

An operating plan should serve as the primary resource document for operating a waste management unit. It should include the technical details necessary for a unit to operate as designed throughout its intended working life. Briefly the operation of a waste management system should include the following activities:

- Provide proper maintenance and operation of ground-water, surface-water, and air controls.
- Develop daily procedures to place waste, operate environmental controls, and inspect and maintain the unit.
- Review at a regular interval, such as annually, whether the waste management system needs to be updated.
- Develop a waste analysis procedure to ensure an understanding of the physical and chemical composition of the waste to be managed
- Develop regular schedules for waste screening and for unit inspections.
- If daily cover is recommended, select an appropriate daily cover and establish processes for placing and covering waste.
- Consider how operations can be affected by climate conditions.
- Implement security measures to prevent unauthorized entry.
- Provide personnel with proper training.
- Establish emergency response procedures and familiarize employees with emergency equipment.
- Develop procedures for maintaining records.
- Establish nuisance controls to minimize dust, noise, odor, and disease vectors.

2.3.2.6 Guidelines on Industrial Waste Management

The following guidelines emerge regarding Industrial Waste Management, also applicable for Waste Water Treatment.

1. **A hierarchical approach** is recommended to industrial waste management: first, prevent or reduce waste at the point of generation (source reduction); second, recycle or reuse waste materials; third, treat waste; and finally, dispose of remaining waste in an environmentally protective manner.
2. **Good Housekeeping:** appropriate provisions to prevent leaks and spills and to achieve proper, standardized operation and maintenance procedures and practices;
3. **Input Material Change:** replacement of hazardous or non-renewable inputs by less hazardous or renewable materials or by materials with a longer service life-time;

4. **Better Process Control:** modification of the working procedures, machine instructions and process record keeping for operating the processes at higher efficiency and lower rates of waste and emission generation;
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7. **On-Site Recovery/Reuse:** reuse of the wasted materials in the same process or for another useful application within the company;
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9. **Product Modification:** modification of product characteristics in order to minimize the environmental impacts of the product during or after its use (disposal) or to minimize the environmental impacts of its production.

2.3.3 Comfort Pursuit in Buildings

Alessandro BENAZZI^[4]

2.3.3.1 Introduction

Every physical environment is characterized by many factors which collaborate in close relationship with each other, among which we can easily identify thermo-hygrometric, bright, spatial, biological and auditory components.

For physical environment we mean the portion of space, considered in the totality of its features, with which living beings interact.

It is for these reasons that the various possible combination on these factors make some environments might be considered more ideal than others to accommodate humans.

We can define comfort zone as the set of environmental characteristics necessary for man to adapt to a given location with the least expenditure of energy.

This is an extremely subjective relation that each individual entertain with the external environment to his own person.

More simply we can speak of a feeling or a series of sensations perceived by a user in the various context in which this person lives. It is an index used to indicate the perceived well-being level.

In general we can say that a person is in a well-being state when it does not receive any sort of nagging feeling, setting then itself in a state of absolute neutrality compared to the surrounding environment.

High comfort levels in workplaces help to maintain a good working stimolous and to keep high levels of concentration. Below we will analyze in particular two of comfort aspects: bright component and thermo-hygrometric one.

A felt comfortable temperature on workplace improves the mood and the propensity to work, bringing to carry out their tasks more enjoinable and with superior results. Good lighting levels instead help to delay fatigue feelings and to increase brain's vegetative functions, improving for example certainty and speed of calculation.

Then we will deal with health care facilities issue, not only understood as a workplace of doctors and nurses, but also as a place of patient's permanence.

2.3.3.2 Thermo hygrometric comfort

Because of the many parameters which define the environmental condition, and because of their combined contribution, it's impossible to judge comfort on the basis of only one or some of its variables.

This becomes evident by analyzing some of the factors that define the thermo hygrometric comfort:

Physical parameters: air temperature, mean radiant temperature, relative humidity, air speed, atmospheric pressure;

External parameters: activity carried out, metabolism, clothing;

Organic factors: age, gender, individual physical characteristics;

Subjective factors: psychological and cultural factors.

Humidity and temperature parameters, for example, are closely related one to each other. The following table shows the effects that different combinations of temperature and relative humidity have on humans.

Temperature	Relative Humidity	Feelings experienced
24 °C	40 %	Maximum well-being
24 °C	85 %	Well-being at rest
24 °C	91 %	Fatigue, depression
32 °C	25 %	None discomfort
32 °C	50 %	Impossible to work continuously
32 °C	65 %	Impossible to heavy work
32 °C	81 %	Increase in body temperature
32 °C	90 %	Strong malaise
36 °C	10 %	None malaise

36 °C	20 %	Impossible to heavy work
36 °C	65 %	Need of rest
36 °C	80 %	Malaise

The table shows how increasing temperature, the feeling of well-being that man perceives, increases with decreasing percentage of relative humidity.

Parameters such as air speed, in the same way, are able to decrease the perceived temperature.

Considering open spaces, increasing temperature, air speed of 1 m/s are considered pleasing and values up to 1.5 m/s can be tolerated.

Inside a closed environment, in cold season, air speed should not exceed 0.25 m/s.

In summer conditions, instead, the comfort zone can be extended to temperatures higher than 26 °C (normally considered as the maximum limit recommended within an environment) if the air speed increases of 0.275 m/s for each Celsius degree of temperature increase, up to a maximum temperature of 28 °C and a maximum air speed of 0.8 m/s.

It is for this reason that during hot summer days ventilation devices are frequently used to reduce the perceived temperature.

However, the fact that characteristics which determine the comfort can be perceived in different ways by different subjects must be taken into account.

It's clear as the well-being cannot be measured analytically but only according to statistical methods, because it depends on many variables including some of purely subjective and psychological nature.

Some studies elaborated by psychologist Michael Humphreys also introduce an adaptive model arguing that the conditions of perceived comfort also depend on the geographic area of belonging.

In fact, there are observed differences between the temperatures considered comfortable depending on geographical origin.

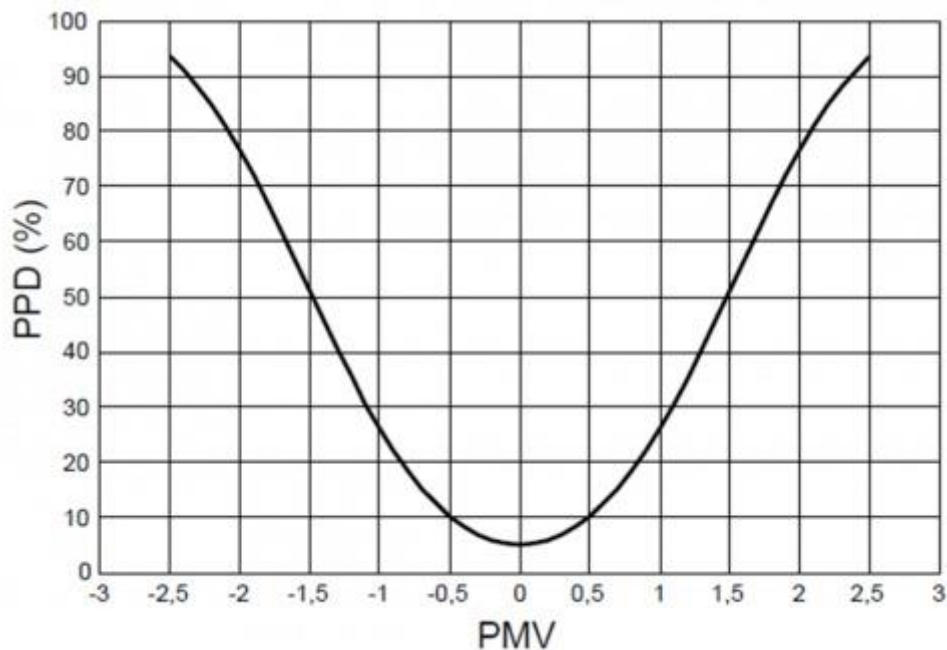
The method used for the evaluation of thermal comfort in an environment, developed by Danish scientist P. O. Fanger, is the basis of the International Standard ISO-7730 Standard since 1984.

In this method, two values are defined:

PMV - Predicted Mean Vote. It's an index for evaluation of well-being state that takes into account environmental and subjective variables. It's a mathematical function that results in a value from -3 (perception of intense cold) to +3 (perception of intense heat). Zero represents the state for thermal comfort.

PPD - Predicted Percentage of Dissatisfied. Give the percentage of dissatisfied subjects with the thermo hygrometric conditions of a given environment.

Because the method developed by Fanger is a statistical model based on the perceived comfort level of many individuals, the resulting diagram is a Gaussian with a 5% of disagreement subjects on the neutrality status.

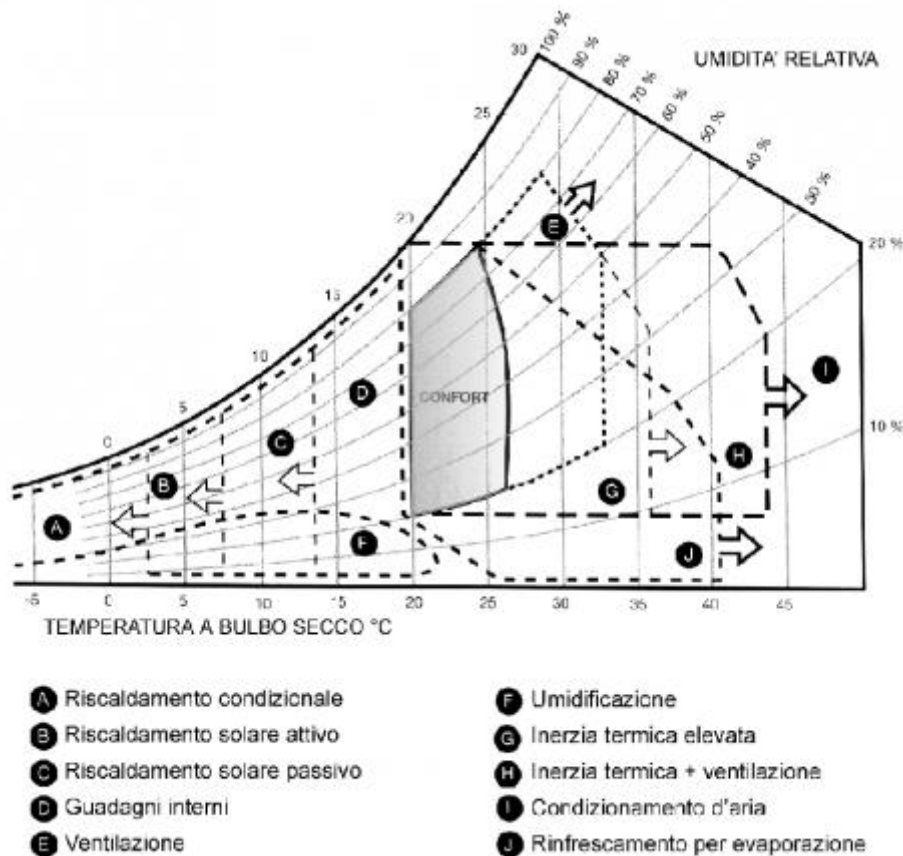


Buildings are the main instruments that enable man to reach the comfort zone. They have the possibility, to absorb, filter, or reject the elements that characterize the external environment, depending on their beneficial or negative contribution to human comfort, especially if their design is not only limited to the geometric definition of the spaces, but extends to the implementation of a system capable of respecting human needs having minimal impact on the environment that surrounds us.

Therefore, we must not think that we can solve all the problems related to comfort through the installation of heating, cooling and air handling unit.

Some tools, like the Olgyay's diagram and the Givoni's psychrometric-bioclimate chart, indicate what are the most appropriate passive strategies to extend the perimeter of the zone of thermal comfort, intended as the site of the climatic environment within which the thermal sensation is judged comfortable by over 80% of people.

The primary objective is to reduce as much as possible the need for corrective interventions by mechanical means, compatibly with the regional climatic conditions.



Givoni's psychrometric-bioclimate chart shows how, for instance, the design a building in an environment characterized by high temperatures and high levels of relative humidity requires the adoption of natural ventilation strategies in order to achieve comfort conditions.

Instead, at the same temperatures and in case of low humidity levels, the comfort zone can be extended designing building envelope characterized by a high thermal inertia.

Good quality in residential buildings leads to improvement of comfort level in addition to a considerable energy saving. These are, in fact, two aspects that often goes hand in hand.

A thermally well-insulated house implies the absence of cold surfaces around the user. The mean radiant temperature, which is the weighted average temperature of the surfaces that define a room has a great influence on heat transfer by radiation and intervenes in the perceptions of thermal comfort.

Radiant floor or ceiling heating systems have in the same way a dual effect: firstly they are able to heat or cool a room uniformly, being equipped with a large thermal exchange surface. Second, it should be noted that the very high thermal exchange surface requires significantly lower water supply temperatures than those used in classical radiators, a factor that leads to minimize consumption in heating.

The installation of ventilated walls is particularly recommended in warm climates. In this case the coating exposed to the sun warms the air in the cavity triggering upward motions that

helps in keeping the inner wall surface cool. Instead, the same type of wall is inefficient in colder climates, where the use of solar greenhouses to heat adjacent rooms is recommended.

2.3.3.3 Bright comfort

Bright comfort is another very important aspect related to buildings. The light is an essential tool for human life. Thanks to the bright contribution, man is able to perceive rooms and distinguish colors. In architecture, light is key to making comfortable interiors.

Interior's lighting must allow a user to carry out its tasks without difficulty, distinguishing objects and spaces. This result can be achieved through natural lighting, supplemented if necessary with artificial lighting.

Keep in mind that the artificial light, although it can be adjusted in quantity and intensity, cannot recreate the quality of natural light in terms of color rendering.

In order to ensure satisfying illumination, the total area of the windows of a room should not be less than 10-12% of the floor area of that space. High windows also allow greater depth penetration of solar radiation compared to low and long one.

Particular emphasis is assumed by the colors and finishes of the inner surfaces which allow to obtain a good reflection and uniformity of light. A smooth white wall will reflect up to 85% of the light that strikes it.

Inside the rooms it is important that ratio between the illumination of areas with more light and less enlightened points is not too high, to avoid eyes fatigue in the transition between lighted surfaces and shaded surfaces.

It is then important to consider that the "necessity" of light is not the same for everyone: good lighting will allow anyone to work in optimal conditions.

In order to obtain high internal comfort conditions it is therefore essential that each project is studied in relation to the context in which it will be realized. The lighting must always be appropriate in quantity and quality to the activities that will be carried out in the room.

The orientation studies and the shape of buildings, in relation to latitude and solar diagrams, allows to obtain excellent levels of natural lighting. Knowing the inclination of sun's rays at a given latitude is possible to shield, according to needs, the incoming solar radiation in the interior.

Frequency and hours of operations will be also carefully considered, as well as the function that the building will accommodate. For example, in scholastic buildings, frequented mainly during morning hours, classrooms with facing south-east windows will be preferred.

In the case of integration needs with artificial lighting, it is necessary to use lamps characterized by a frequency that does not cause eye strain, without glare or flicker, even if imperceptible.

2.3.3.4 Comfort in health care facilities

In health care facilities, even more than other functions, the problem of comfort is paramount.

Status of patients, often bedridden for long periods of time, makes the achievement of environmental conditions as much appropriate as possible to their needs fundamental.

However, a reflection is required to understand how a place can be considered comfortable by a sick person.

Recent studies have shown that patients affected by Alzheimer's disease have a different perception of their surroundings than other inpatients. It has been demonstrated, for example, that the sight of radiators inside the rooms stimulate the memory of warmth feelings. Without these, patients affected by dementia, even in heated rooms, feel in many cases cold sensations.

However, there are many fewer studies concerning the perception of comfort by patients suffering from other infirmities.

It is clear how, depending on the disease, the perception of comfort levels can vary for each patient. This argument focuses on a problem: how can we set up an environment in hospitals so that it can collect well-being feelings in the greatest possible number of patients?

The humanization of health care facilities has become a priority in Italy at the beginning of the new millennium, when it was indicated as necessary by a study commission of the Health Ministry charged with preparing the identikit of the hospital of the future.

This task, entrusted to architect Renzo Piano, had resulted in the development of a compendium of "good practice" to be followed in the design of hospital facilities.

The result pointed out as fundamental design of an environment which, although equipped with all the functional requirements for health care settings, takes on a character as much as possible domestic, able to feel at ease patients and their families.

If the rule followed in the past to build a place of care was starting from technical requirements dictated by doctors, nurses, managers and administrators, the one of today turns everything upside down, forcing us to see things through patient's eyes.

This is why we tend to find more and more patient rooms with one or at most two beds, well-lit and painted with bright colors and high-contrast (shades are hardly perceived by patients of advanced age).

The presence of warm colors, so far from the idea of sterile hospital ward, transmits to those who enjoys environments positive feelings and induce them to delete the sense of strangeness generally associated with the idea of the hospital.

Domotic systems to open and close the curtains, turn on radio or television, and the possibility to dispose of second bed for a visiting relative, bring the hospital of the future towards hotel standards.

The hospital building in this perspective can be seen itself as a cure able to relieve the sense of unease and instability of the patients, helping them to recover in a more positive and optimistic attitude, and contributing to the healing process.

Any therapeutic effort may get better results if the spaces of care are organized, bright, colorful and welcoming, and if the treatment does not require renunciation to social life.

2.3.4 Sustainable stormwater management^[5]

Dr. Ignacio ESCUDER-BUENO, Dr. Ignacio ANDRÉS-DOMÉNECH, Sara PERALES-MOMPARLER, Adrián MORALES-TORRES

2.3.4.1 Why Sustainable Stormwater Management?

Cities around the world are facing a range of pressures including rapid urbanisation and urban sprawl, industrialisation and climate change. The ecological ‘footprints’ of cities are ever expanding through continued exploitation of available resources – land, water, energy, food, building materials, finance – while also producing large volumes of waste (solid, gaseous, liquid) which contaminate soils, air and water. Conventional water and energy management meanwhile, struggles to manage ever scarcer water and energy resources, to deliver services without adversely impacting the quality of life of urban populations and the environment.



When land is developed, the natural cycle of water is altered. In general, urban development re-moves vegetation and increases impervious surfaces (roofs, roads...). These changes produce less evapotranspiration, less infiltration and more runoff.

Conventional drainage systems (drains, pipelines, drainage channels, etc.) are the most common approach to managing stormwater in urban areas. These systems have generally been designed to remove rainfall from the urban environment as rapidly as possible. This results in the following problems (Philip, 2011):

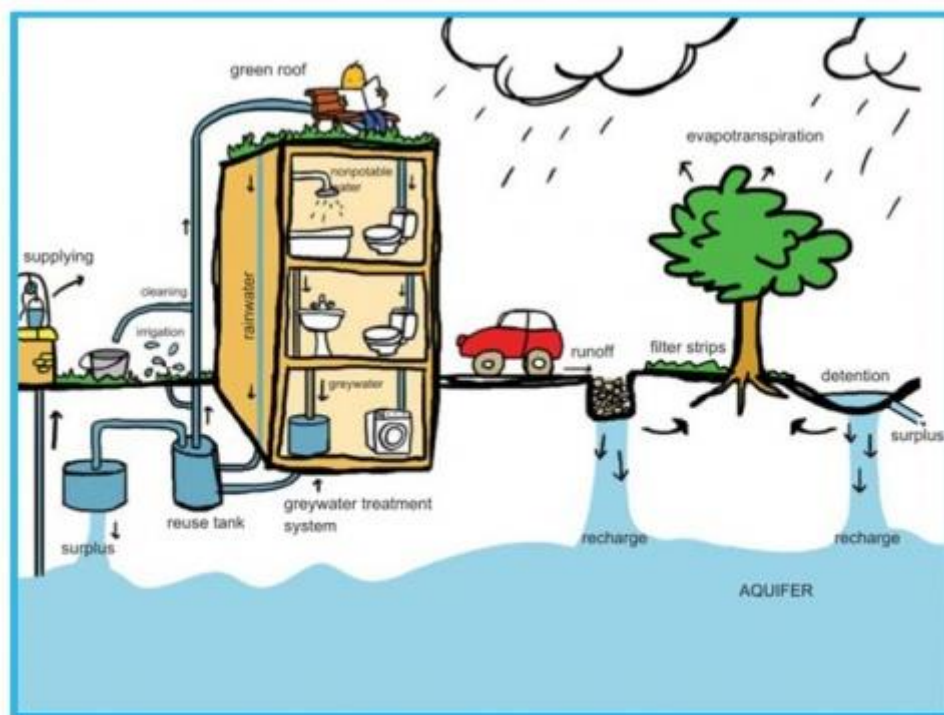
- Combined sewer overflows: Heavy rainfall causes combined sewer to exceed capacity, resulting in overflow of untreated wastewater being released to the environment.
- Diffuse pollution: Non-point source pollutants in the form of heavy metals, oils, nutrients and pesticides are dispersed by runoff into receiving water bodies.
- Decreased base flow in rivers and streams: Increases in impervious surfaces decreases groundwater recharge.
- Downstream flooding: The rapid collection and disposal of stormwater into receiving water bodies increases the risk of downstream flooding.

Furthermore, these problems may worsen due to climate change and larger urban developments. In order to solve these problems, urban drainage should move towards more flexible and adaptive approaches.

In comparison to conventional stormwater management, a sustainable approach focuses on both managing the risks resulting from urban runoff and its contribution to environmental and landscape improvement. Sustainable Drainage Systems (SuDS) objectives are to minimize the impacts from urban developments with regards to stormwater quantity (flooding) and quality (pollution) and maximize amenity and biodiversity opportunities (Woods-Ballard et al., 2007). SuDS can help to solve the problems associated with conventional drainage by contributing to flood control, pollution control and can also provide an alternative source of water for non-potable uses.

2.3.4.2 Sustainable Drainage Systems

Sustainable Drainage Systems (SuDS), also known as Best Management Practices (BMPs), Low Impact Developments (LIDs), Water Sensitive Urban Design (WSUD) or Green Infrastructure (GI), are designed to manage stormwater following natural hydrologic processes. The basic principle is to decentralize retention: to infiltrate and reuse at source as much rainwater as possible both in public and private spaces.



Sustainable Drainage Systems in the urban water cycle. Adapted from (Perales-Momparler and Valls-Benavides, 2013).

SuDS make use of common sense and simple technologies, embracing a broad range of typologies such as rain gardens, rain barrels, green roofs, swales and porous surfaces for car parking and roads (USEPA, 2014), (Woods-Ballard et al., 2007). These systems are now broadly accepted in many countries particularly the US, Australia and northern Europe. Evidence is now available that SuDS are a viable option in Mediterranean regions as well (Perales-Momparler et al., 2014). However, understanding of the concept is still developing, with implementation limited due to lack of knowledge and expertise throughout the region.

The following sections explain the characteristics of those types of SuDS best suited for Industrial Areas and Technology Parks.

2.3.4.2.1 Rain harvesting systems

Stormwater from roofs and impervious surfaces can be stored and reused in and around properties. With these systems, water collected is used for non-potable purposes, such as flushing toilets and irrigation.

2.3.4.2.2 Green roofs

A green roof is a vegetated roof system that filters, absorbs, and retains or detains the rain that falls upon it. Green roofs comprise a layer of soil media planted with vegetation over a waterproofing membrane. They may also include additional layers such as a root barrier and drainage and irrigation systems. Green roofs serve several purposes for a building, such as absorbing rainwater, providing thermal insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and mitigate the heat island effect. There are two types of green roofs:

- **Intensive roofs:** They are thicker and can support a wider variety of plants, but are heavier and require more maintenance.
- **Extensive roofs:** They are covered in a light layer of vegetation and are lighter than an intensive green roof. This is the type usually used for stormwater management.

Water is stored in the substrate of a green roof and then taken up by the plants from where it is re-turned to the atmosphere through transpiration and evaporation. When the soil media becomes saturated during rainfall events, the excess water percolates through to the drainage layer and is discharged through the roof downspouts. Green roofs can provide high rates of rainfall retention and decrease the peak flow rate because of the temporary soil storage during discharge events. Furthermore, the layer of vegetation provides effective insulation of a building, preventing the escape of heat during cold weather and keeping the interior cool during hot weather.

2.3.4.2.3 Permeable pavements

Permeable pavements provide a pavement suitable for pedestrians and/or vehicles, while allowing rapid infiltration of water into the soil or a reservoir. This reservoir provides temporary storage as runoff infiltrates into underlying permeable soils and/or out through an underdrain system. There are two main categories of pervious pavements:

- **Pervious asphalt and pervious concrete:** Similar to conventional asphalt and concrete in structure and form, except that the fines (sand and finer material) have been removed. The top layers are thicker than traditional pavements to provide the required stability.
- **Permeable pavers:** Structural units, such as concrete blocks, bricks, or reinforced plastic mats, with regularly dispersed void areas used to create a load-bearing pavement surface. The void areas are filled with pervious materials (gravel, sand, or grass turf) to create a system that allows for the infiltration of stormwater runoff.

Permeable pavements have very good removal of both soluble and particulate pollutants, where they become trapped, absorbed or broken down in the underlying soil layers.

2.3.4.2.4 Infiltration trenches

An infiltration trench is a shallow trench in permeable soil that is lined with filter fabric and backfilled with washed rock. The trench surface may be covered with grass, stone, sand, or plants. They collect runoff during a storm event, store it in the void spaces within the stones, and release it into the soil by infiltration. By diverting runoff into the soil, an infiltration trench not only treats the water quality volume, but also helps to preserve the natural water balance on a site and can recharge groundwater and preserve baseflow. Infiltration systems are limited to areas with highly porous soils where the water table and/or bedrock are located well below the bottom of the trench. Using the natural filtering properties of soil, infiltration trenches can remove a wide variety of pollutants from stormwater through sorption, precipitation, filtering, and bacterial and chemical degradation.

Ideally a pre-treatment device (such as a filter strip or grassed area) should be incorporated to increase the longevity of the system. It is also an option to add a geotextile layer just below the surface to trap silt and stop it from clogging the gravel deeper in the trench. Inspection manholes should be located at regular intervals along the length of the device.

2.3.4.2.5 Geocellular systems

Geocellular systems are modular plastic structures with a high void ratio (around 95%) that can be used to create an underground infiltration or storage structure. The systems can be designed to withstand traffic loads, so they can be installed under car parks as well as recreational areas and other public open space. Geocellular systems can contribute to stormwater management in two different ways:

- **By facilitating infiltration:** Through the provision of a storage structure that is wrapped in permeable geotextile and which allows the stormwater to infiltrate into the ground.
- **By creating storage volumes:** Through the provision of a structure that is wrapped in a suitable robust impermeable geomembrane that provides storage for stormwater runoff. This option is appropriate where ground conditions are not suitable for a soakaway. In this case, it works like a detention structure and can be designed as either on-line or off-line.

Runoff can enter in these systems through infiltration from a permeable surface above or through a perforated inlet/distributor pipe. In this case, runoff must be filtered to avoid sedimentation.

2.3.4.2.6 Bioretention areas / Rain gardens

Bioretention areas / Rain gardens are vegetated shallow depressions that rely on vegetation and either native or engineered soils to capture, infiltrate, transpire and remove pollutants from runoff, thereby reducing stormwater volume, attenuating peak flow and improving stormwater quality. They feature plants adapted to the local climate and soil moisture conditions that can tolerate periodic inundation. In bioretention areas, pore spaces, microbes, and organic material in the engineered soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants into the soil matrix. Plants utilize soil moisture and promote the drying of the soil through transpiration. If no underdrain is provided, stored

water in the bioretention area / rain gardens is infiltrated into the underlying soils over a period of days.

For areas with low permeability native soils or steep slopes, bioretention areas / rain gardens can be designed with an underdrain system to route the treated runoff to the storm drain system rather than depending on infiltration.

2.3.4.2.7 Filter strips

Filter strips are vegetated strips of land designed to treat sheet flow runoff from adjacent impervious surfaces or intensive landscaped areas. They are typically linear facilities that run parallel to the impervious surface and are commonly used to receive runoff from walkways and driveways. Filter strips are covered with vegetation, including grasses and groundcover plants, which filter and reduce the velocity of stormwater. As the stormwater travels across the strip, it may infiltrate into the soils below. Filter strips are generally very effective in trapping sediment and particulate-bound metals, nutrients, and pesticides.

2.3.4.2.8 Filter drains

Filter drains are gravel filled trenches that collect and convey storm water and also treat pollution. The trench is filled with free draining gravel and often has a perforated pipe in the bottom to collect the water. Filter drains are best located adjacent to impermeable surfaces such as cars parks or roads.

The perforated pipe is not required along the entire length of the trench, only near the end of the device. Ideally a pre-treatment device (such as a filter strip or grassed area) should be incorporated to increase the longevity of the system. It is also an option to add a geotextile layer just below the surface to trap silt and stop it from clogging the gravel deeper in the trench. Inspection manholes should be located at regular intervals along the length of the device.

2.3.4.2.9 Vegetated swales

Vegetated swales are broad, shallow channels designed to convey and either filter or infiltrate storm-water runoff. Swales are vegetated along their bottom and sides and are used to reduce stormwater volume through infiltration, improve water quality through infiltration and vegetative filtering, and reduce runoff velocity by increasing flow path lengths and channel roughness.

Vegetated swales can be designed as part of the stormwater conveyance system and can potentially eliminate the need for kerbs, gutters and storm drains. They are also well suited to treat runoff from roads and highways because of their linear nature. Swales can be connected to many other treatment measures, such as wet ponds, infiltration basins, and wetlands. They can significantly reduce runoff volume in very permeable soils.

Vegetated swales are designed with limited longitudinal slopes to force the flow to be slow, thus allowing particles to settle and limiting the effects of erosion. Berms and/or check dams installed at right angles to the flow path promote settling and infiltration.

2.3.4.2.10 Infiltration basins

Vegetated infiltration basins are flat-bottomed, shallow landscaped depressions used to collect and hold stormwater runoff, allowing pollutants to settle and filter out as the water infiltrates into the ground. Stormwater temporarily forms pools on the surface of the basin, then infiltrates. Pollutant removal is accomplished by natural mechanisms within the soil including filtration, absorption and adsorption, and chemical and biological uptake.

They are either excavated or created with bermed side slopes. An inlet pipe, swale or sheet flow over impervious area conveys the stormwater into the basin, where it is temporarily stored until it infiltrates into the ground. Basins often provide complete infiltration for small storm events. They can be sized to infiltrate large storms in areas where soils drain well or they can overflow to an approved discharge point.

2.3.4.2.11 Detention basins

Detention basins are surface facilities intended to store stormwater runoff temporarily to reduce downstream water quantity impacts and provide flood protection. They temporarily detain stormwater runoff, releasing the flow over a period of time. Generally, detention basins are designed to fill and empty within 48 hours of a storm event. They also facilitate some settling of pollutant particles. They are designed to drain completely following a storm event and are normally dry between rain events. If designed with vegetation, basins can also create wildlife habitat and improve air quality.

2.3.4.2.12 Retention ponds

Retention ponds are one of the most cost-effective and widely used stormwater treatment practices. The typical configuration of a retention pond includes a forebay, a permanent storage, and variable storage areas. The forebay is a small inlet pool that provides a pre-treatment allowing settling of coarse and medium grained sediment. Permanent storage refers to the permanent pool of water remaining in the wet pond between storm events and during dry weather. If intended as permanent water feature, supplemental water and the installation of an impermeable liner may be required to maintain the permanent pool during the dry season. Variable storage refers to the remaining storage capacity in the wet pond that will vary based on stormwater influx. The stormwater in the variable storage area will generally drain from the pond 24 to 48 hours after the end of a storm event.

2.3.4.2.13 Constructed wetlands

Constructed wetlands are shallow marsh systems designed to both improve stormwater quality and provide some control of runoff volumes. As stormwater runoff flows through the wetland facility, pollutant removal is achieved through settling and contaminant uptake by marsh vegetation. Wetlands are among the most effective stormwater practices in terms of pollutant removal and also offer aesthetic value and wildlife habitat.

They have a shallow and relatively constant depth of standing or slow-flowing water and contain both emergent vegetation and open water. Vegetated areas foster microbial communities that transform and remove stormwater pollutants, while open water areas aid in pathogen removal and hydraulic circulation.



Rainwater harvesting system in Coventry (United Kingdom).



Greenroof in Benaguasil (Spain)



Pervious asphalt in Benaguasil (Spain)



Infiltration trench in Hamburg (Germany)



Construction of a geocellular system in Oleiros (Spain)



Rain garden in Washington DC (USA)



Filter strip leading to wet swale in Scotland



Filter drain in Crevillent (Spain)



Vegetated swale in Lyon (France)



Infiltration basin in Cincinnati (USA)



Detention basin in Dunfermline East Expansion (Scotland)



Retention pond in Lyon (France)

2.3.4.3 Stormwater management and energy



Improvement of energy efficiency with Sustainable Drainage Systems.

Water and wastewater facilities frequently represent the largest and most energy-intensive burden for water utilities, representing up to 35% of municipal energy use (NRDC, 2009). Using a sustainable approach for stormwater management can potentially reduce energy consumption in the urban water cycle, as follows:

- Reducing potable water use reduces energy consumed in acquiring and treating drinking water.
- Reducing stormwater inflows to sewer systems reduces energy consumed in pumping and treating wastewater.
- Improving stormwater quality results in less treatment required before release into the environment.
- Reducing local temperatures and improving buildings' insulation (with green roofs) reduces cooling and heating demand for buildings, reducing energy needs and decreasing emissions from power plants.

2.3.5 Integrating Renewable Energy Systems in Mediterranean Landscape

Anthi CHARALAMBOUS^[6], Harris KORDATOS^[7], Stefano MUGNOZ

2.3.5.1 Introduction

The growing use of Renewable Energy Sources (RES) is leading to a new awareness about their compatibility with landscape and heritage preservation policies. If at national and European scale the development of RES can be considered as a positive, desirable and necessary development, the local scale is challenged in terms of changes of territorial assets, especially regarding ecological and cultural landscapes. The RES market growth, if not suitably regulated, while on the one hand it may cause the increase of the overall energy production, on the other hand it may induce a decrease in competitiveness in terms of attractiveness, strictly related to landscape assets. Thus a region that aims to become more

competitive and sustainable, needs to carry on both RES system implementation and territorial preservation, and hence to look for a good balance between all these growth factors. The Enerscapes project investigates the opportunity of balancing these issues by developing a methodology for landscapes assessment in introducing the RES in Mediterranean territories. The Enerscapes methodology perfectly fits with the aims of the MER project, in particular for the development of new sustainable industrial areas in which the environmental and landscape issues are important for the area planning and the impacts of the RES equipments could have a relevant role.

2.3.5.2 RES and landscape in the Mediterranean area

RES energy production and landscape protection are particularly relevant in the Mediterranean area. Firstly, the presence of high energy potentials, especially regarding solar and wind energy, is a pre-condition that may produce a strong development in Mediterranean countries. Mapping energy potentialities in these areas can support the definition of more effective policies at EU level.



Mediterranean area is also very sensitive in terms of cultural and ecological landscape values, historical stratification and tourism development. One risk, connected with high energy potentials, is the uncontrolled development of new plants, negatively affecting landscape qualities: for example in some parts of Andalusia's coastal areas, the increase of wind farms deteriorated the ecological and cultural landscape, with also potential negative effects in terms of tourism activities. In Italy, similar risks are occurring with ground-mounted PV plants, that become an element of land consumption and landscape deterioration, with negative effects for agricultural and tourism activities. On the other hand, another critical factor is the limited development of RES sector, mainly due to the absence of adequate incentives and strategic policies: this delay in RES development, as emerged, for example in Malta's territorial analysis, may hinder the achievement of EU, national and local goals in terms of RES production and in achieving the independence from non-renewable resources.

Another problem is the sectorial approach, very frequent in the Mediterranean planning tradition. Energy is in fact usually addressed within sectorial policies, both at national, regional and local level, without proper consideration of environmental and social issues.

Starting from these premises, the comparison among different local contexts supported the identification of different types of obstacle and the elaboration of solutions on the ground of the partners' experiences. The strategic approach was necessary for evaluating the quantity

and quality of the impact related to the installation of RES systems. An improvement of procedures would lead to a greater attention towards the landscape factor, making it more relevant within the process of planning and locating plants. Besides the introduction of an effective cost-benefit analysis with regard to the RES plant installation, it will also reduce mistakes in the phase of the environmental impact assessment.

The integrated management of territories could foster economic diversification and increase in employment, especially in rural areas, more exposed to economic decline. The studies on RES can promote investments in this field at local level, destined to grow in the future, supporting the settlement of new economic activities, including the production of technological goods and specialized services. Moreover, the preservation of landscape and cultural heritage can help to attract sustainable tourism.

2.3.5.3 Methodology for landscape assessment

The specific purpose of the Enerscapes project was to define a sound and replicable methodology for the landscape assessment – landscape as a “reception frame” – within policy, planning and decision-making procedures devoted to renewable energy sources. According to territorial analysis and by using a powerful participatory process to involve citizens, stakeholders and key actors, partners formulated a set of scenarios and a common set of indicators for scenarios’ assessment in order to choose the most suitable one for the selected areas. Then each partner elaborated a local Action Plan that comprises the definition of the strategy and of a set of actions and activities to reach the scenario within 2020.

Therefore, the Enerscapes partnership has promoted a comparison among the Action Plan structures and activities in order to organize a common methodology structured in a set of guidelines in order to enable other territories to repeat, improve and refine the methodology, taking environmental considerations into account during the planning and decision-making process above the project level.

The main stages of the methodology that was developed in Enerscapes are presented below and in Figure 1, full version is available at www.enerscapes.eu .



Stage A: Setting the context and establishing the baseline

Context Analysis:

The so-called “knowledge framework” dealt with any previous plans or programmes and external environmental objectives such as those laid down in general and specific policies or

legislation. These relationships were identified to enable potential synergies to be exploited and any inconsistencies and constraints to be addressed.

Characters and planning restrictions had to be integrated into a spatial database built on according to the specifications of the INSPIRE Directive. That way the various layers of information on the planning framework, the environmental and landscape characteristics and renewable sources of energy can be comparable.

Recognition of assets and values of landscapes:

In order to implement the evaluation of territorial assets and values, each Pilot Area had undergone an analysis of its intrinsic values. The analysis was based on a common set of elements, qualifying cultural landscapes and ecological landscapes and elaborating maps of the pilot area where the elements are recognizable and measurable.

Evaluation of the Sensitivity and definition of Landscape Quality Objectives.

During this phase of the research, in order to define specific Landscape Quality Objectives within given areas and landscape units, as required by the European Landscape Convention, all partners were able to make use of different approaches anyhow related to concepts such as “Vulnerability” and “Sensitivity”. Sensitivity is a crucial concept within the Characterization approach. Landscapes that are highly sensitive are at risk of having their key characteristics fundamentally altered by development. Landscape Quality Objectives would consequently be settled in order to maintain the characters and functional performances of a given area, for instance by introducing thresholds to soil and water exploitation following environmental requirements or limits to land consumption closely related to more specific morphological and ecological issues.

Stage B. The Scenario Analysis

Identifying alternatives and choosing preferred alternatives:

At this stage of the research, the Scenario Analysis was introduced and performed for each Pilot Area in order to compare different forecasts depending on different sets and amounts of RES that could likely be introduced, and to select, case-by-case, the most suitable scenario(s) in order to implement the Action Plan.

Consulting Authorities with environmental responsibilities.

A crucial role in the selection of scenarios was played by participation, called upon to bridge the gap between the so-called “expert knowledge” and “common knowledge”, and to strengthen the legitimacy of the Action Plan, which will be shaped on the selected scenario. In fact, the participatory process is needed to raise awareness among key actors, such as stakeholders, target groups and the public at large

Stage C: Assessing the effects of the plan

Predicting the effects of the plan and evaluation of effects:

Authorities should seek to predict and evaluate the effects of elements of the evolving plan – options, policies, proposals and revisions – while they are working on them. Where adverse effects are seen to be likely, possibilities for mitigation should be considered

Assessment methods.

In order to evaluate the degree of consistency (to reckon different levels of interaction/ interference) of the selected Scenario (and of the Action Plan stemming from it) with the values recognized and some options expressed by planning tools already in force, an unavoidable step is the evaluation of a sort of “external coherence”. This implies the construction of a matrix, able to stress a set of retroactive types of interrelations among planning objectives at different scales.

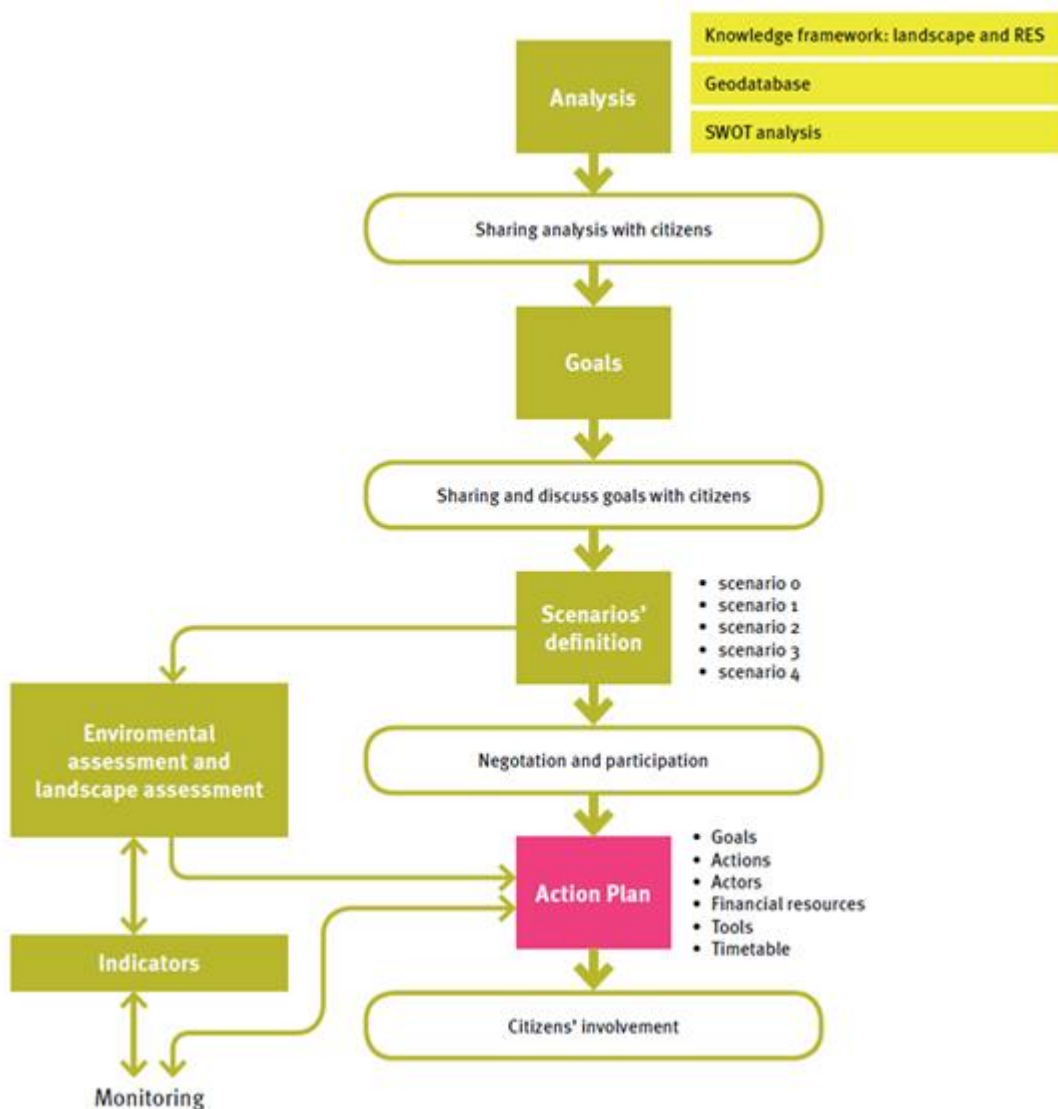


Figure 1. Enerscapes methodology

The methodology that was developed through the Enerscapes project can be applied in various landscapes and for different kind of RES systems. A future installation of an Eco Innovative Industrial area requires the presence of RES systems which in many occasions are near to important sites with high ecological and cultural value. Enerscapes methodology is

able to evaluate possible locations of an Eco Innovative Industrial area for a better spatial-territorial planning reducing that way environmental and cultural consequences.

According to these premises, the Enerscapes project was intended as an experimental process able to integrate the development of RES with landscape protection, realising Local Action Plans on the ground of local and national legal framework. Indeed, the integration among policies, programmes and planning activities, was consequently central both to promote RES and to avoid negative externalities at local level, that may also be the cause of resistance among the population.

Within Enerscapes, innovation meant process and governance innovation. By connecting energy planning, landscape and territorial planning, partners identified strategies for considering ecological, landscape and heritage aspects while setting up RES promotion policies. Starting from the construction of a common basis on best practices and normative solutions, partners defined an assessment method and common rules with the perspective of environmental-landscape safeguard for RES introduction in the MED Area. Involved dimensions were: landscape ecology (biodiversity, ecology networks), landscape and heritage (cultural landscapes, historical values, preservation), agriculture sector (biomass production, use of land, for solar energy production in place of cultivations), technology (renewable energy production methods), environmental assessment, administrative procedures, economy green growth for the territories.

As regards landscape, Enerscapes put at the centre the idea that whenever RES are involved, landscapes need to be previously “referred to” as visible and sensitive expressions of environmental fragility. They have to be considered as “reception frames” for any transformation, which, according to the European Landscape Convention focuses on “the aspirations of the public with regard to the landscape features of their surroundings”. This approach marks a fundamental step towards the acknowledgement of “everyday” landscapes, both in material and symbolic terms. According to current experiences in participative planning, communication about landscape and environmental issues is being brought outside the inner circle of experts, towards the population involved in planning decisions. Thus, we could definitely argue that the core of the problem is to raise social awareness by communicating and discussing opportunities and threats related to different scenarios and visions. In this regard, Enerscapes elaborated a shared assessment of landscapes “historic”, “social” and “environmental” values within the process of introduction of RES systems into MED territories and landscapes.

NOTES

1. ENEA
2. ANATOLIKI S.A.
3. ANATOLIKI S.A.
4. ICIE - Cooperative Institute for Innovation
5. This document has been elaborated within the European project E2STORMED (www.e2stormed.eu) for the MER project. The text has been extracted from: Escuder-Bueno, I., Andrés-Doménech, I., Perales-Momparler, S. and Morales-Torres, A. (2014) Work Package 3.B: State of the art, analysis and proposed indicators and adaptation measures: Storm-water management methods and techniques. www.e2stormed.eu.
6. CEA
7. CEA

2.4 Eco-Innovative Industrial and Enterprise Zones and Funding: Third Party Financing

Konstantinos KONSTANTINOU^[1], Iakovos SARIGIANNIS^[2]

2.4.1 Scope and objectives of Third Party Financing

The concept of sustainable SMEs in sustainable Industrial Areas (IAs), provides means of smart, 'environmentally friendly' investing such as Third Party Financing.

SMEs usually have difficulties in finding suitable resources for applying green solutions for energy efficiency measures. This study answers to their needs by examining ways of creating new services and contributing to enhance competitiveness.

Third Party Financing is a new and innovative way of financing an environmentally friendly investment either for a single SME or for clustered SMEs in an Industrial Areas. It is a tool that helps to raise environmental awareness among the actors of the industrial sector, without negative impacts onto the entrepreneurial goals, while fostering the sustainable development of SMEs.

The Third Party Financing instrument is defined through the different EU policy approaches and shaped through the Energy Service market and the market's basic actors, the Energy Service Companies (ESCOs). Current trends and issues are examined and coupled with a brief overview of the TPF framework in each Partner's country. TPF methods are specified through the analysis of different TPF mechanisms and specific tools as the Energy Performance Contracting (EPC).

2.4.2 TPF: An Instrument for Energy Efficiency

2.4.2.1 Energy efficiency in the EU

2.4.2.1.1 Terms and expressions

For the purpose of this paper, the following definitions of terms and expressions have been applied. The definitions are established through the Council **Directive** 2006/32/EC on **energy end-use efficiency and energy services** (ESD) and subsequently, by the newer Directive 2012/27/EU on Energy Efficiency.

Energy	all forms of commercially available energy, including electricity, natural gas (including liquefied natural gas), liquefied petroleum gas, any fuel for heating and cooling (including district heating and cooling), coal and lignite, peat, transport fuels (excluding aviation and maritime bunker fuels) and biomass as defined in Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market [14];
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energy efficiency	a ratio between an output of performance, service, goods or energy, and an input of energy;
energy efficiency improvement	an increase in energy end-use efficiency as a result of technological, behavioural and/or economic changes;
energy savings	an amount of saved energy determined by measuring and/or estimating consumption before and after implementation of one or more energy efficiency improvement measures, whilst ensuring normalisation for external conditions that affect energy consumption
energy service	the physical benefit, utility or good derived from a combination of energy with energy efficient technology and/or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to lead to verifiable and measurable or estimable energy efficiency improvement and/or primary energy savings;
energy service company (ESCO)	a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria;
energy performance contracting	a contractual arrangement between the beneficiary and the provider (normally an ESCO) of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement;
third-party financing	a contractual arrangement involving a third party — in addition to the energy supplier and the beneficiary of the energy efficiency improvement measure — that provides the capital for that measure and charges the beneficiary a fee equivalent to a part of the energy savings achieved as a result of the energy efficiency improvement measure. That third party may or may not be an ESCO;
energy audit	a systematic procedure to obtain adequate knowledge of the existing energy consumption profile of a building or group of buildings, of an industrial operation and/or installation or of a private or public service, identify and quantify cost-effective energy savings opportunities, and report the findings;

financial instruments for energy savings	all financial instruments such as funds, subsidies, tax rebates, loans, third-party financing, energy performance contracting, guarantee of energy savings contracts, energy outsourcing and other related contracts that are made available to the market place by public or private bodies in order to cover partly or totally the initial project cost for implementing energy efficiency improvement measures;
final customer	a natural or legal person that purchases energy for his own end use;

2.4.2.1.2 Energy efficiency and the European Energy Service Market

2.4.2.1.2.1 Energy efficiency in the EU

Energy efficiency can be seen as Europe's biggest energy resource, claims the European Commission through its Energy Efficiency Plan 2011, introducing 2020 target of saving 20% of the European Union's primary energy consumption. In the following chapters we will see how this is possible and in what way Third Party Financing can contribute to that.

According to Directive 2012/27/EU on Energy Efficiency, amending directive 2006/32/EC **on Energy End-use Efficiency and Energy Services** energy efficiency is a ratio between an output of performance, service, goods or energy, and an input of energy. The improvement of this ratio contributes to the reduction of primary energy consumption, to the mitigation of CO₂ and other greenhouse emissions and to the prevention of dangerous climate change. Energy efficiency, or technically speaking, the use of less energy inputs while maintaining an equivalent level of economic activity, is one of the most cost effective ways to enhance security of energy supply, and to reduce emissions of greenhouse gases and other pollutants.

Overall, the **"Europe 2020" process** creates a new governance context and additional tools for the EU to steer its efforts on energy efficiency. The Commission proposes a two step approach to target setting. As a first stage, Member States are currently setting national energy efficiency targets and programmes. These indicative targets and the individual efforts of each Member State will be evaluated to assess likely achievement of the overall EU target and the extent to which the individual efforts meet the common goal. The Commission will support and provide tools for the Member States in the elaboration of their energy efficiency programmes and closely monitor their implementation through its revised legislative framework and within the new framework provided under the Europe 2020 process.

In 2014, the Commission shall assess the results obtained and whether the programmes will, in combination, deliver the European 20% objective. Moreover, by 30 April each year, Member States (MS) shall report on the progress achieved towards the national energy efficiency targets. This report shall be complemented by an estimate of expected primary energy consumption in 2020. Supplementary reports by each MS shall be submitted by 30 June 2014 and every three years, with information on national energy efficiency policies, action plans, programmes and measures implemented or planned at national, regional and local level to improve energy efficiency in view of achieving the national energy efficiency targets.

2.4.2.1.2.2 Energy Efficiency Services

The European Committee for Standardisation defines **energy efficiency services (EES)** as an agreed task or tasks designed to lead to an energy efficiency improvement and other agreed performance criteria.

A core element of each EES is thus an **energy efficiency improvement (EEI) action**, which is any action that directly leads to a reduction in energy consumption. EEI actions include different types of activities:

- substitution of technology
- improvement of technology
- better use of technology
- behavioural change

EES delivers **solutions** addressing specific technology which answers to the needs of the customers, such as: building structure / heating system / ventilation & cooling / lighting system / electric appliances / motors, pumps and more.

The **customers** addressed by the EES are usually categorized as follows:

- private households
- commerce & (private or public) services (office buildings / hospitals / schools / shopping centres)
- industry (energy-intensive branches / SMEs etc)
- transport

Each Energy Efficiency Improvement consists of different phases, each of them adding **value** in terms of the achieved energy savings:

- Awareness raising
- identification of measures
- technical planning
- financing and implementation (operation, supervision)
- optimisation and technical operation
- measurement and targeting

An EES provider can implement an all-in-one approach or stick to specific phases of the value chain.

2.4.2.1.2.3 Energy Efficiency Service Providers – The Role of ESCOs

EES providers can be energy distributors, energy/governmental agencies, consulting/engineering/installation companies, technical organizations and more. However, this study focuses on Energy Efficiency Companies (ESCOs) - as defined in the ESD – proposed as an effective financing instrument by numerous EU policy documents.

According to the ESCO Status Report 2011, the first companies offering services in the energy field and applying the ESCO concept appeared in Europe as long ago as the 1800s. The cradle of these so-called “operators” or “managers” was France (Dupont and Adnot 2004). The concept moved to North America and boomed during the 20th century (EC DG JRC 2005). Companies offering integrated energy efficiency solutions started to spread again throughout Europe in the 1980s (EC DG JRC 2007). Energy service companies (ESCOs) have been operational on a large scale since the late 1980s-early 1990s. However, today the energy service market in the European Union is far from utilizing its full potential even in countries with a particularly developed ESCO sector.

ESCOs deliver energy efficiency improvements, accepting financial risk by covering – or helping to finance - upfront investment costs and refinancing this through the savings achieved^[3]. ESCOs^[4] can be fundamentally different from other EES providers in the following ways:

- ESCOs guarantee the energy savings and / or the provision of the same level of energy service at a lower cost
- The remuneration of ESCOs is directly tied to the energy savings achieved
- ESCOs typically finance or assist in arranging financing for the installation of an energy project they implement by providing a savings guarantee
- ESCOs retain an on-going operational role in measuring and verifying the savings over the financing term

ESCO solutions provide diagnosis services, financial projects, project management, installation and administration of technological plants in order to reduce energy consumption. The reduction of costs made by less energy consumption will recover the investment of ESCO. ESCOs manage and fund projects with own financial resources or by external credits institutes.



Figure 1 - Financial relationships between ESCO, client and Financial Institute

The key-feature for ESCOs is the **financial risk** they accept for the achievement of improved energy efficiency in a user’s facility. They actually have their payment from the services delivered based (in whole or at least in part) on the achievement of those energy efficiency improvements.

2.4.2.2 Energy Efficiency financing

As far as Energy Efficiency financing is concerned, any Energy Efficiency Service should not be only economically viable. Liquidity has to be secured in order to avoid any risk of insolvency of the EES provider. Conforming to the Energy Efficiency Plan 2011, for ESCOs to play their role, they need access to financial resources. Innovative financing with high leverage both on national and European level would be an appropriate way to catalyse the development of energy service market, for example, through the expansion of access to project-based financing via instruments that may include provision of liquidity and guarantees, credit lines and revolving funds.

As reported by Irrek et al (2010)^[5], the start phase of EES development, qualification and training, market introduction and marketing can be costly and has to be pre-financed before sales generate sufficient income to cover and pay back these start costs. Therefore, the provision of EES is a capital – intensive business, where the degree of capital intensity depends on the following factors:

- Level of transaction costs, (e.g. costs of information and search for energy efficient technology options and prices offered by different suppliers of this technology, costs of drawing up a contract, costs of co-ordinating the implementation of the EES etc);
- Position of the EES in the value chain (see image 1), mainly referring to the capital-intensive parts in the value chain such as planning and implementation;
- If the EES includes also the pre-financing of the investment, capital intensity increases because in this case incomes are shifted further to the future.

The above costs carry certain risks for the customer (SME or other), especially for a customer who is a first-time EES user. In addition to the financial risks, there also exist technical as well as other types of risks^[6] like the one related to the functioning of the applied technical systems, the compliance with the existing standards and more.

The sharing of these risks depends on the financing typology used for the financing of the EES. According to ESCOS Status Report (2005), there exist the following financing typologies:

Third-party financing (TPF) refers solely to debt financing. As its name suggests, project financing comes from a third party, e.g. a finance institution. The finance institution may either assume the rights to the energy savings or may take a security interest in the project equipment.

On the other hand, according to the Energy Service Directive (2006) the Third Party may or may not be an ESCO. Alternatively, from the customer's point of view, the following three financing typologies are distinguished^[7]:

- Self-financing (the customer uses own funds)
- Debt-financing (the customer borrows from a Financing Institute)
- Third Party Financing (a Third Party – other from the customer and the energy provider – finances)

2.4.2.2.1 Third Party Financing

Directive 2006/32/EC defines Third Party Financing as “a contractual arrangement involving a third party — in addition to the energy supplier and the beneficiary of the energy efficiency improvement measure — that provides the capital for that measure and charges the beneficiary a fee equivalent to a part of the energy savings achieved as a result of the energy efficiency improvement measure”.

TPF can be implemented on several areas, namely, energy savings technologies, power and heating systems, co-generation, environmental design (wastes elaboration), water treatment and supply, renewable energy sources and so on. Whatever the energy investment and the area of the implementation is, TPF involves the following actors:

- **Energy Supplier**
- **Beneficiary or TPF user or customer:** the party interested to invest on energy saving technologies. This party lacks the necessary financial resources and / or the available technology.
- **TPF Provider:** energy company, producer of energy utility systems, private company, consortium of institutions (banks, constructive companies, insurance companies), Energy Service Company (ESCO).

There are **two conceptually different TPF arrangements**; the key difference between them is which party borrows the money: the EES provider or the customer:

The first option is that the EES provider borrows the financial resources necessary for project implementation.

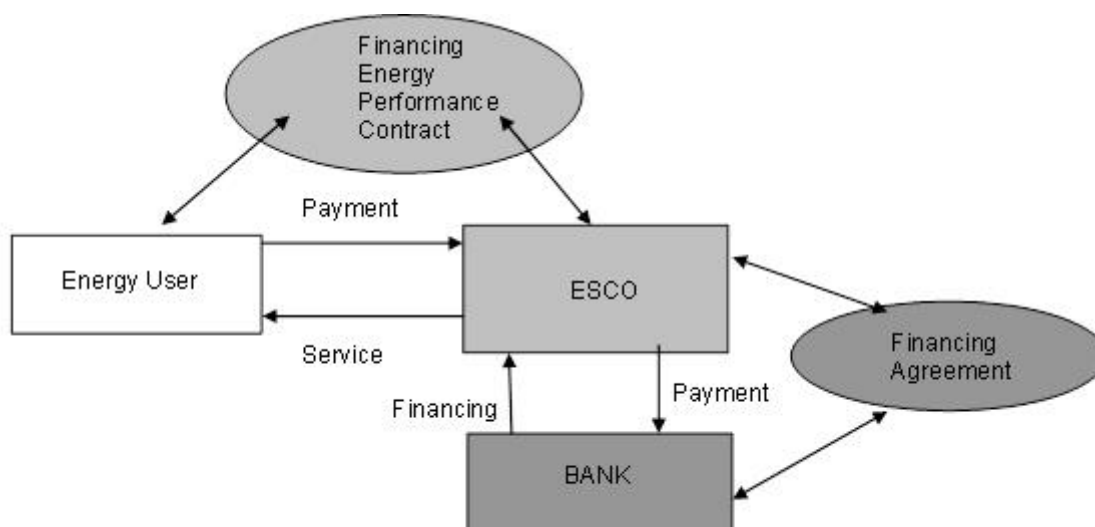


Figure 2 – Third Party Financing with ESCO borrowing

Source: Reproduction from Joint Research Centre for the EC, 2005: Energy Service Companies Market in Europe, Status Report – chapter 3 Energy services and associated terminology: definitions

The second option is that the energy user/customer takes a loan from a finance institution backed by an energy savings guarantee agreement with the EES provider showing that the energy savings achieved will certainly cover the debt repayment.

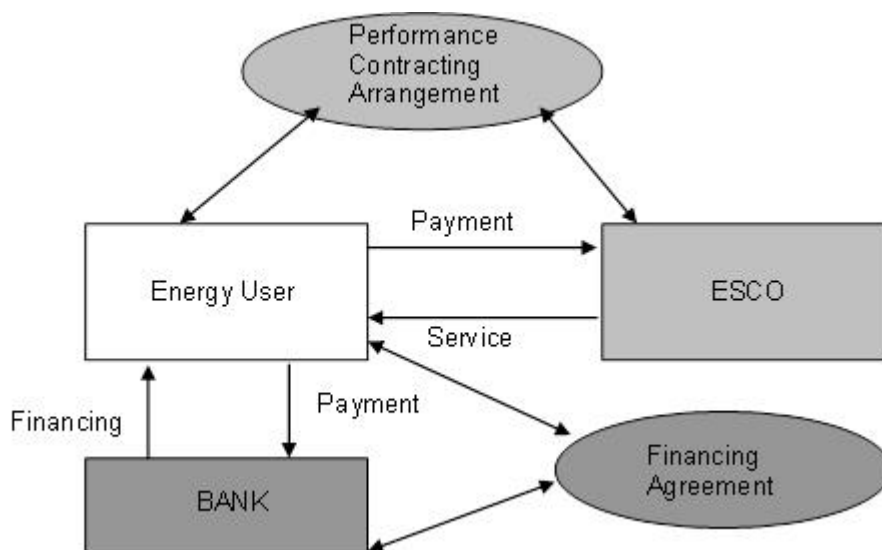


Figure 3 - Third Party Financing (TPF) with energy user / consumer borrowing

Source: reproduction from Joint Research Centre for the EC,2005: Energy Service Companies Market in Europe, Status Report – chapter 3 Energy services and associated terminology: definitions

It has to be mentioned that in the first case, when the ESCO is the borrower, the customer is safeguarded from financial risks related to the project technical performance.

As a result of its nature, **the Third Party Financing option includes a risk - management approach** and therefore shares the burden of risks with the customer. The degree of risk taken by the EES provider in a TPF case depends on the scope of activities decided to be carried out (see value chain – image 1):

an all-in-one approach, where all the phases of the value chain (from awareness raising to measurement and targeting) are being carried out. This approach increases the amount of risks but, on the other hand, makes it easier to manage the risks because of full responsibility over the process as a whole.

Contrariwise, **a selective approach** (where only specific phases of the value chain are being carried out) limits the types of risks one has to deal with but may make it more difficult to handle these risks because of the interface to other contractors. A careful planning, calculation and preparation of the EES reduces awkward situations during the implementation phase. Of course, not all possible external influences can be foreseen, still the preparation is crucial and should take place proportionally to the size and expected income of the project.

A well – designed EES contract is very important to the minimization of risks for both the customer and the EES provider. For example, clear rules with regard to duties during all phases as well as transfer of ownership at the end of the contract duration, adequate clauses with regards to changes in usage conditions etc.

In other words, the beneficiary (customer) avoids investment costs by using part of the financial value of energy savings - that result from the third party's investment - to repay the third party's investment and interest costs.

Regardless the approach used, the importance of the TPF instrument for energy efficiency investments lies in the following advantages:

- reduced financial risks for the client, related to the project technical performance
- possibility to make a structural intervention without financial resources (clients);
- energy and environmental certification (paid to ESCO by green certificates);
- outsourcing of energetic management

2.4.2.2.2 Energy Performance Contracting (EPCs)

ESCOs can guarantee the results and take on the performance risk through Energy Performance Contracting (EPC). **EPC is defined as a comprehensive energy service package**, aiming at the guaranteed improvement of energy and cost efficiency of buildings or production processes. An external ESCO carries out an individually selectable cluster of services (planning, building, operation and maintenance, (pre-) financing, user motivation...) and takes over technical and economic performance risks and guarantees.

EPC should be clearly distinguished from energy supply contracting (delivery contracting) that is focused on the supply of a set of energy services (e.g. lighting, heating, motive power etc) mainly via outsourcing the energy supply. In contrast, EPC targets savings in production and distribution.

EPC is based on the transfer of technical risks from the customer to the ESCO based on performance guarantees given by the ESCO. In EPC, ESCO remuneration is based upon demonstrated performance; a measure of performance is the level of energy or cost savings or the level of energy service. Cash-poor yet creditworthy customers are therefore good clients for EPC.

An EPC overcomes the need for upfront capital investment. Rather, it guarantees future savings in energy demand to finance practical, engineered plant improvements. It is an innovative way of bringing about change and reducing risk – of overcoming a lack of in-house technical skills, resources and budget.

An EPC enables an organisation to^[8]:

- Reduce the financial risks associated with energy consumption
- Utilise ESCO design, implementation and finance resources to improve the energy efficiency of buildings
- Conduct a detailed energy audit to identify where and how much energy demand can be reduced
- Reap guaranteed cost savings. Energy savings are guaranteed by the ESCO. In the unlikely event of the agreed savings not being delivered, the ESCO makes up the difference.

Under an EPC arrangement, an external organisation (ESCO) develops, implements and finances (or arranges financing of) an energy efficiency project or a renewable energy project, and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment.

Essentially the ESCO will not recover all of its costs unless the project delivers all of the energy savings guaranteed.

The key features of EPC are^[9]:

- An ESCO plans and realizes energy efficiency measures and is responsible for their operation and maintenance throughout the contract term
- The ESCO has to guarantee energy cost savings compared to a present state energy cost baseline
- The efficiency investments are (partly) paid back out of the future energy cost savings.
- The client continues to pay the same energy costs as before (sometimes a smaller amount). After termination of the contract, the entire savings will benefit the client.
- The ESCO's remuneration is the contracting rate and depends on the savings achieved. In case of underperformance the ESCO has to cover the short fall.

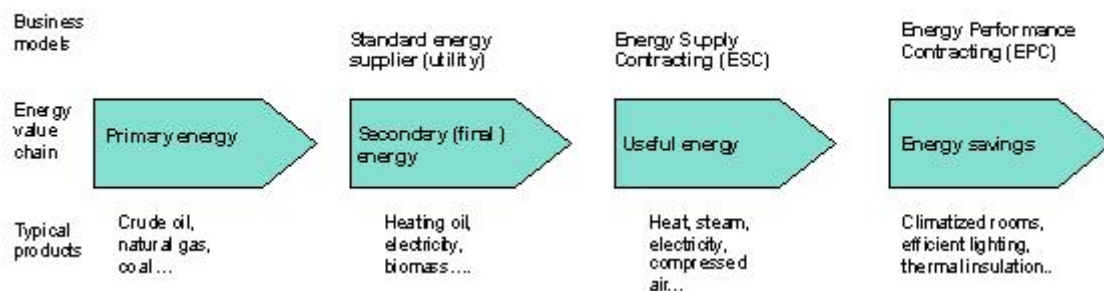


Figure 4 – Energy service value chain, business models and typical products

Source: reproduction from Bleyl – Androschin et al (2010), Financing options for energy-contracting projects – comparison and evaluation (IEA DSM TASK XVI) – chapter 2.3 Energy-contracting basics.

2.4.3 Third Party Financing – Current trends and issues

In 2005, Bertoldi and Rezessi for EC JRC explained that in Europe most ESCOs have been founded either by large companies or as subsidiaries of large companies and under EPC arrangements have provided financing themselves (mainly in France and Germany). Only recently have more ESCOs started implementing EPC using TPF with a private bank or a lending institution as a project financier.

TPF has only recently started to attract the attention of ESCOs and project developers in Europe, where the market is segmented in “functionally specialized” companies (i.e. companies specializing in supply contracting for industry rarely compete directly with those specializing in performance contracting in buildings). The majority of ESCO projects in Europe have been undertaken by the public sector, primarily because the public sector is perceived as having “safer” clients that do not normally go out of business.

The most common projects have been in co-generation, public lighting, heating, ventilation, and airconditioning (HVAC), and energy management systems. The recent energy industry restructuring has stimulated projects in combined heat and power (CHP) for large commercial centres, hospitals, and industrial facilities. It has also triggered public lighting projects, where municipalities tendered lighting operation, including the supply of electricity. Boiler house improvements (and the provision of “heat service”) have featured significantly in many ESCO contracts too, particularly in the public sector.

Recently, Bleyl – Androschin et al (2010), have indicated the existence of a strong need to create new capabilities and incentives in local markets for Local Financing Institutions (LFIs) and end-users **to finance energy efficiency projects**. If such financing is reliably available on a commercially – viable basis, plenty of ESCOs will get off the ground and will be able to provide their own working capital for marketing and project preparation and development. For instance, training the personnel of local banks in financing energy efficiency projects is expected to have a very positive impact on the provision of commercially viable and sustainable project financing. It can potentially bridge the gap between the traditional asset – based corporate lending and the cash – flow based project financing to energy efficiency projects (ESCO Status Report, 2005).

In addition, incentives should be provided to “first movers” in the finance sector active in financing energy efficiency and renewable energy projects. Funding feasibility studies, energy audits and the preparation of financing applications would increase their ability to secure additional information and decrease the amount of equity capital required. Sources of debt and equity financing need to be located. Several **possible financing sources should be investigated**: private banks and lending institutions; venture capital firms; equity funds; strategic partnerships (e.g. utilities and engineering firms); leasing companies; and equipment manufacturers. Encouraging and assisting existing leasing companies to offer energy – efficient equipment is another option.

A revolving fund to finance energy – efficiency measures could also be set up. Dedicated debt organizations offering e.g. 80 – 100% financing for projects could be established and could use the above sources. Under this opinion, a master loan agreement would be standardized and executed between an ESCO and the debt facility which would commit the lender to provide financing according to defined terms and conditions. Funds would be drawn down on a project-by-project basis. The balance of financing would come from the ESCO, the customer or another equity investor. Alternatively, the debt facility could provide 100% of project costs, but returns to the debt facility would be higher to reflect the higher risk.

According to the analysis outlined in the impact assessment of the Energy Efficiency Plan 2011, the best way to approach energy efficiency at EU level is a **coherent policy mix where TPF holds a significant position**. In particular, given the economic crisis, the limited financial resources at EU level cannot be expected to be dedicated to energy efficiency. Therefore, it is essential that the measures taken by the MS should aim at better engagement of TPF. Measures that could further support the engagement of private investors are energy savings obligation on energy utilities and support for the development of ESCOs.

Despite the potential for energy services the market development of such services is still poor. Considering the significant heterogeneity of market situation within EU-27, the EU value added is in supporting capacity building and defining clear EU energy efficiency services concept and approaches. In the Energy Efficiency Plan 2011 – impact assessment, ESCOs are

identified as a sector that requires additional support in terms of information, guidelines and exchange of best practices.

ESCOs deliver energy efficiency improvement measures in a user's facility and accept some degree of financial risk by tying part or all of their payment on the achievement of savings. These companies could serve as an important interlocutor between the energy utilities (even some utilities are developing ESCOs subsidiaries) and the end-users.

The EU could **define clearer common definitions** and possible **harmonized approaches** such as pan-European standard model processes for e.g. the selection, the procurement, the development or the verification and measurement of energy savings. This would ensure the delivery of higher quality services in Europe and it would avoid confusion and ease the transfer of best practices across Europe.

The EU could also support the creation of specific **national** (or regional) **business support structures** in the field of energy efficiency services. In addition the EU could promote the setting up of local project support entities (e.g. “one stop shop”) that could offer a wide range of services in order to assist project owners implement energy savings in their buildings.

Energy efficiency services have a great role to play in helping the market tap into the large reservoir of energy savings potential. So far, the public sector is where energy performance contracts have been the most used.

The European market potential for ESCOs has indeed been estimated to be at least €5-10 billion per annum and €25 billion in the long-term. The annual amount of energy savings that could be achieved through energy efficiency services is estimated to represent 10 to 30% of the overall energy savings potential in Europe^[10].

The advantages of TPF implementation (K. Konstantinou, 2010) are:

- The user does not have to be concerned about up-front capital and can place its resources in other investments.
- The provider assumes all risks inherent to the project, both technical and financial.
- The user is not required to have technical expertise by its own.
- The user enjoys a set of services with “one signature” (“one-stop” shopping).
- The user enjoys better prices for the equipment (economies of scale).
- The user becomes owner of the equipment at the end of the contractual period.
- TPF is compatible with existing legislation.

On the other hand, TPF may present some disadvantages as follows:

- The lack or shortage of capital in general.
- The unwillingness of banks and financing institutions.
- The restricted market of innovative technologies and the reduced interest to establish ESCOs.
- The unawareness of users about the possibilities offered by TPF.
- The complexity of TPF contracts.
- Administrative and legal barriers.
- The low energy prices of conventional fuels.

In summary, developing a **TPF network** that would include ESCOs, associations of ESCOs, national and regional energy efficiency agencies, lighting and equipment manufacturers and suppliers, electrical and mechanical contractors, financial institutions, utilities, and other suppliers of energy services that have an interest in accelerating investments in energy efficiency would bring the benefits of co-ordinating the efforts towards penetration of energy-efficient technologies collaborating information dissemination, and periodically exchanging information on members' experiences.

Notes

1. ANATOLIKI S.A.
2. ANATOLIKI S.A.
3. Energy efficiency Plan 2011
4. Joint Research Centre for the EC, 2005: Energy Service Companies Market in Europe, Status Report
5. E7 Energy Markt Analyse GmbH (2010) for CHANGEBEST (Task 3.1)
6. See E7 Energy Markt Analyse GmbH (2010) for CHANGEBEST (Task 3.1), chapter 3.7 - Risks
7. Bleyl – Androschin et al (2010), Financing options for energy-contracting projects – comparison and evaluation (IEA DSM TASK XVI)
8. Energy Performance Contracting in the European Union
9. Bleyl – Androschin et al (2010), Financing options for energy-contracting projects – comparison and evaluation (IEA DSM TASK XVI)
10. IEE supported project ChangeBest

2.5 Taking Advantage of Green Marketing Plans

Alfredo VALENTINO^[1], Matteo CAROLI^[2]

2.5.1 The Evolution, Definition and Purpose of Eco-Innovative Industrial and Enterprise Zones

During the last few years sustainable development is attracting the attention of scholars and practitioners. It is considered as a common agreed aim especially after the Johannesburg World Summit. According to this summit, “industry-environment” interactions play a pivotal role to improve the transition from a non-sustainable world to a sustainable one (Mouzakitis, Adamides and Goutsos, 2003). Scholars speak about industrial ecology, that studies the energy and matter flows to optimize waste management and to reduce the global pollution (Tibbs, 1992). Following the idea of natural cycles, industrial ecology redefines the industrial facilities and infrastructures as if “they were a series of interlocking manmade ecosystems interfacing with the natural global ecosystem” (Mouzakitis et al., 2003, p. 85).

One of the main area of development for industrial ecology is the field of eco-industrial parks (Erkman, 1997). Lowe and Evans (1995) define the concept of eco-industrial park as “... a community of manufacturing and service firms located together in a common property. Member businesses seek enhanced environmental, economic and social performance through collaboration in managing environmental and resource issues. By working together, the community of businesses seeks a collective benefit that is greater than the sum of individual benefits each company would realize by only optimizing its individual performance”. This goal is achievable planning and re-qualifying the industrial areas and their infrastructures to reduce pollution and improve symbiotic cooperation and energy efficiency (Lowe, 1997). Current industrial estates are characterized by a low degree of cooperation where firms use to share only land and infrastructures. They consist of a linear model (extract-consume-dump),

where resources and waste are used in an unsustainable and inappropriate way, causing an intense disturbance to the stable state of the natural ecosystem. The idea of eco-industrial park is towards a twisting of classical industrial estate and the establishment of a “system” which consists of business activities, natural sources, energy, raw materials, waste, final products, and labor. The first step of this transition is the creation of exchange networks in eco-industrial parks, like a natural system where there isn’t “waste” defined as something that cannot be absorbed constructively in the system (Lowe, 2001). This aim is achievable “making maximum use of recycled materials in new production, optimizing use of materials and embedded energy, minimizing waste generation and re-evaluating wastes as raw material for other processes” (Tibbs, 1992). A web of interactions among the main elements of the system (e.g. individual firms) represents the main characteristic of eco-industrial park compared with the classical idea of industrial estate. However, connectivity within eco industrial park is necessary but not a sufficient condition to achieve and improve sustainability at regional level. So, these interactions should go beyond the boundaries of the industrial park (Mouzakitis et al., 2003), involving other firms and institutions.

According to the above logic, the movement from a classic industrial estate to an eco-industrial park requires interventions at three different levels: individual firm (dematerialization, eco-efficiency, etc.), industrial estate (collective management, exchange network, web of interactions, etc.), and at the boundaries of the system (legislation, institutions, etc.) (Mouzakitis et al., 2003).

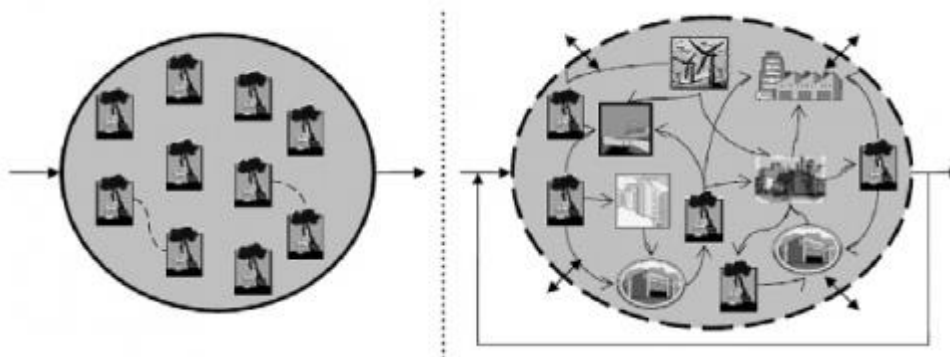


Figure 1. Industrial estate and Econ-Industrial Park.

Source: Mouzakitis et al. 2003

The concept of eco-industrial park is a powerful economic development tool, that can provide benefits both to the involved firms, and to the local and wider community (Lowe, 1997). Participating at eco-industrial park, companies can decrease production costs through an efficient and sustainable use of materials, energy and waste. Moreover, they can achieve an extra income through the sale of waste material, input for other firms (Lowe and Evans, 1995; Mouzakitis et al., 2003). Operational costs related to infrastructures and facilities (used for production and energy supply, treatment of water, logistics, etc.) are shared by all participants at the park (Lowe, 2001). Finally, the web of interactions among firms improves the possibility to solve common problems and to spread knowledge, information, and innovation.

At local community level, these parks make the area more liveable, reducing pollution industrial waste and harmful substances. Moreover, the eco-industrial development may lead to additional employment and capital investment. The presence of an eco-industrial park can also improve the visibility of the area, pushing national and international firms to relocate into the park to get knowledge spillover effects.

For wider community an eco-industrial park can be considered as a working model to demonstrate how it is possible to apply the principles of sustainable development in the industrial word.

According to the Research Triangle Institute, the development of an eco-industrial park “involves different strategies, that, taken alone, are previously tested and proven but have rarely been combined in a single project. As with any untested concept, particularly one that requires this level of interdisciplinary integration, there are risks and challenges” (Research Triangle Institute, 1996). These challenges usually involve four different groups of stakeholders: planners and constructors, management and development agencies, potential EIP members and finally regulatory institutions. For planners and constructors the main decisions are about the selection and landscape of the site, and the design of buildings, industrial facilities and infrastructures. Their decisions should maximize energy and materials efficiency through sustainable buildings or bio-climatic architecture, and provide to the park the flexibility and the strength to grow and evolve (Kirbert, 1994). Management and development agencies should be able to recruit companies, establish relationships, develop financing strategies, and define strategic and performance goals and managerial styles. The EIP members should reduce risks related to the identification of potential partners within park. Besides the technical compatibility and quality standards in activities, the main issue is the psychic and mental distance between partners. Moreover, when relationships have been established, companies could lose a supplier or a customer, if their partners decided to move out of the parks for a new location. Here, the challenge is to find methods that are able to reduce this kind of uncertainty. Finally, the local and national institutions play a promoting role to encourage knowledge and innovation transfer within the park and sponsoring the image of park outside.

Looking at their characteristics, eco-industrial parks can be public or private. In public park, the owner is the local authorities frequently in collaboration with main local Universities. Usually a local authorities-controlled company is established with a managing board, composed by a delegate of each participating company, of the local authorities and of Universities or research centers (Lowe, 2001; While, Jonas & Gibbs, 2010; Senlier & Albayrak, 2011). The managing board plays mainly a supporting and coordinating role (While et al., 2010; Boons, Spekkink & Mouzakitidis, 2011). The main tasks of this board are to (Lowe, 2001; Gibbs, Deuz & Proctor, 2005; While et al., 2010; Senlier & Albayrak, 2011):

- Help companies to create their network and solve their problems;
- Organize specific projects on environmental topics;
- Organize meeting/events;
- Manage public infrastructures and facilities of the park;

- Promote the image of the park outside.

Companies use to pay an annual fee to be part of managing board (Lowe, 2001). In private parks, the owner is a private company that usually owns the site where park is built. This leader company play directly an executive role and it is pivotal for the development of the park. Its main tasks are to (Lowe, 2001; Boons et al., 2011):

- Identify and select potential EIP members;
- Keep out companies that are not in line with the quality standards of the park;
- Manage infrastructures and facilities;
- Organize events and promote the park at national and international level;
- Create the web of interactions among firms within and outside the park.

Marketing plan of an Eco-Industrial Park

A place is not only a context in which firms compete, but especially a context where firms can find material and immaterial factors to achieve competitive advantage and win competition. At the same time, firms share part of their competitive advantage with place, improving its attractiveness and visibility. In literature scholars speak about “virtuous” cycle between place and firms. Places compete for two main goals: improve attractiveness and sustainable development, and create a good environment for firms and local stakeholders. The attractiveness of a place is the right combination of its material and immaterial resources that can influence firms’ strategic decisions and their competitive position.

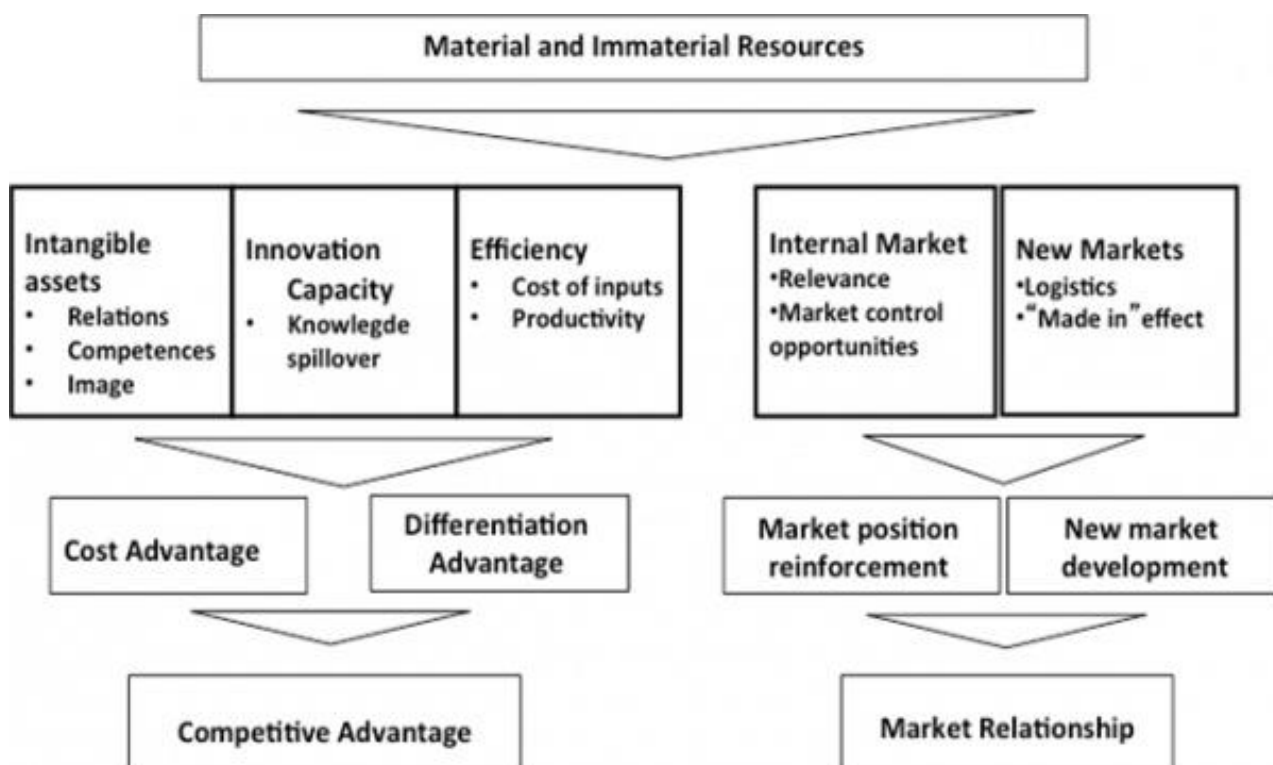


Figure 2. Material and Immaterial Resources of a place

Following this view, Eco-industrial parks (EIPs) can be defined as a product of a place and part of its material and immaterial resources. They are a community where firms and local stakeholders work together sharing resources, competences, services, and infrastructures to improve their social, economic and environmental performances. The main assumption is: the overall performance of all involved firms is more than the sum of performances achieved individually by each firm outside the park (Lowe, 2001). This is due to the requalification of the area, the exchange of waste materials, energy, services and competences, and the use of green infrastructures and technologies. An EIP creates shared value^[3] between involved firms and local stakeholders. From one side, firms can reduce costs and increase internal efficiency, but also enhance their “green” image in customers mind. On the other, local stakeholders improve the quality of life in the area, reduce environmental pollution, increase employment rate. Eco-Industrial parks play an active role in place competition, improving the visibility and the attractiveness of the area in which they are. This value has to be properly communicated. This job is up to the EIP managing board, i.e. the authority designated to manage the park, the offered services, and the involved firms. This authority could only supervise the involved firms, leaving them to implement the best practices or realize the best activities/partnerships (like in Kalundborg, where the involved firms are relatively free to manage their internal web of interactions), or could play directly an active role fostering the attractiveness of the park, and supporting the involved firms to create their network. In the first option, the promotion of the park is up to each involved firm and related to firms’ ability to improve their connections. In the second one, it is one of the main task of managing authority, i.e. to offer the best key conditions improving the attractiveness of the park at the eyes of involved firms and potential newcomers. To achieve this goal the managing authority should construct an appropriate marketing plan that is able to show clearly the attributes of the park and their benefits in terms of performance and value creation for the involved firms. Especially, the EIP

marketing plan should explain why firms should localize their activities within the park, and which benefits these firms could achieve within the park respect to be outside. Thus, it has to show the cost reduction and internal efficiency, but also the improvement in partnership construction the involved firms can achieve being part of the park. EIP marketing plan should influence the perception of potential newcomers and push them to settle their activities within the park, because they understand clearly the differential benefits between being within the park and outside.

In the following sections, we describe the main elements of EIP marketing plan the managing authority has to take into account. We will focus particularly on: vision, strategic aims, demand targets, competitors, strategic positioning, and value proposition. Finally, we introduce the operational tools of marketing plan, with particular attention to product definition, price, and promotion.

Strategic marketing for Eco-Industrial Parks

Vision

The first step to draw up a marketing plan for an EIP is to define its vision. In literature, scholars identify four different visions for an EIP: technocratic, managerial, governance, and holistic. According to the first vision, an EIP is the result of firm productive and location choices to get “proximity” advantage and technical synergies through the management of environmental effects (technical scale economy). The second vision stresses the managerial aspects of EIPs. They are tools to enhance managerial and organizational coordination among firm activities improving efficiency and reducing environmental externalities. The third vision defines an EIP as a governance model of a place, through which local authorities support sustainable development and incentivize firms to get ethic behaviours. Finally, according to the holistic vision, these parks are tools to realize an innovative and cooperative approach to local economic development, based on “public-private” relations. The holistic vision fits completely with the main attributes of EIPs and shows their different involved actors.

These parks are characterized not only by the excellent design of environmental and green infrastructures and technologies, but especially by being a “system” (a “community”) composed by different actors (firms, local authorities, other stakeholders, etc.) that work together to create shared value. Finally, an EIP can be considered as a distinctive asset of a place, that creates value for involved firms and local community.

Strategic aims

The strategic aims of the EIP marketing plan should be in line with the vision. They could be:

1. To achieve the environmental and competitive standards of the best European Eco-industrial Parks;
2. To identify potential firms to be part of the park with a positive impact on the sustainable development of the area;
3. To develop symbiotic relations between involved firms and local authorities.

Demand target

Here we focus on the segmentation of Eco-Industrial Park demand. There are two clear typologies of demand for EIPs: potential newcomers and involved firms (direct demand), and local stakeholders (indirect demand). Firms can be defined as the customers of EIPs with their private aims; while local stakeholders view EIPs as a functional resource to the sustainable development of their place. The private and direct demand (firms) aims to find positive conditions for their competitive advantage. Local stakeholders, instead, want to increase the attractiveness of their place, supporting the sustainable development. So, the difficult job of EIPs is to satisfy these two different demands, but strictly woven together. Focusing initially on the potential and involved firms, they deserve a more careful segmentation according to:

- Main activities (their role in the production chain);
- Size;
- Role played within EIP;
- Awareness to sustainable initiatives.

To better identify target firm members, it is necessary to distinguish between existing EIPs and new ones. In the first case, potential target firm members should have attributes consistent with the most of involved firms or with the leader in the EIP to better exploit industrial symbiotic benefits. In new EIPs, potential target is initially wide. Often it is like of the first big firms settled in the area. Of course, precise quality standards are established such as activities with low environmental impacts, medium size at least, implementation of sustainable strategies, willingness to share knowledge, innovations, infrastructures, and facilities to create shared value.

Looking at local stakeholders, they represent an indirect demand for EIPs. They look at the results of these areas, especially in terms of sustainability. These results could be summarized as follow:

- The presence of a competitive and high-quality productive system in the area;
- The presence of high environmental sensitivity firms;
- The improvement of employment rate;
- The efficient and effective management of local productive areas (Industrial estate);
- The reinforcement of the perceived image of the place as a smart area carefully focused on the reduction of industrial impacts on environment.

Moreover, some stakeholders support financially the development of EIP offer. They can:

- Finance investments in environmental infrastructures, facilities, and services for firms involved in EIPs;

- Co-finance marketing programs to improve the perceived image of EIP and the competitiveness of place in which EIP is;
- Encourage the settlement in EIP through financial incentives to potential newcomers;
- Improve the attractiveness of EIP through specific normative initiatives.

The competitors of EIPs

Competitors of an EIP are usually other EIPs that offer same services, and attract same customers, satisfying same needs. Considering the geographical location of potential newcomers and investors, we identify three types of competitors: local, national, and international. In the first case, an EIP is directly in competition with other EIPs localized in the same geographical area (Province or Region). This competition pushes an EIP to converge towards high quality standards and to specialize itself on specific production chains. At national and international level, an EIP can compete as a system, joining forces with other EIPs in the same province or region, and offering a combined portfolio of services. For this purpose, an EIP should be specialized, but also be able to differentiate its offer, and posit itself on different customer brackets.



Figure 3. The three levels of competitors for Eco-Industrial Parks

Strategic positioning

The strategic positioning places an eco-industrial park into customer perception compared with its main competitors. It is based on the set of attributes that differentiate an eco-industrial park from the others in the mind of customers.

We identify four main positioning factors for an eco-industrial park. These factors use to be:

- High quality of settlement (i.e. availability of strategic assets to achieve a competitive advantage);
- Proximity to target markets;
- Proximity to main actors of production chain.

The starting point is the current positioning of eco-industrial park. Here, it is relevant to understand how potential customers are perceiving the offer of the park, regarding to its services, infrastructures, and facilities.

For example, considering the case of EIPs in Emilia Romagna (a central region in Italy), the analyses on current positioning highlight:

- Low perception of the attributes of EIPs in the mind of customers and, especially, it is completely unclear the differences respect to classical industrial estates;
- Concerns about costs firms should incur realizing their activities within an eco-industrial park;
- Misunderstandings about the eco-industrial nature of the park and its advantages;
- Awareness that the main advantages of EIPs are strictly related to the environmental infrastructures, facilities, and services concretely usable from firms within the park.

After understanding the current positioning, the second step is to move away and identify a target positioning. A useful tool is the cognitive map, that represents customer perceptions. This map is built as a matrix, where the dimensions are the main positioning factors of the EIP. Here, competitors' offers are shown. Cognitive maps are useful to identify "empty" spaces in the customer perception where it is fruitful to place EIP offer. The main challenge for EIP in defining its target strategic positioning is to highlight its ecological nature and its willingness to improve firms and place competitiveness at the same time in a shared value logic (sustainable development for the place and competitive/economic advantages for firms).

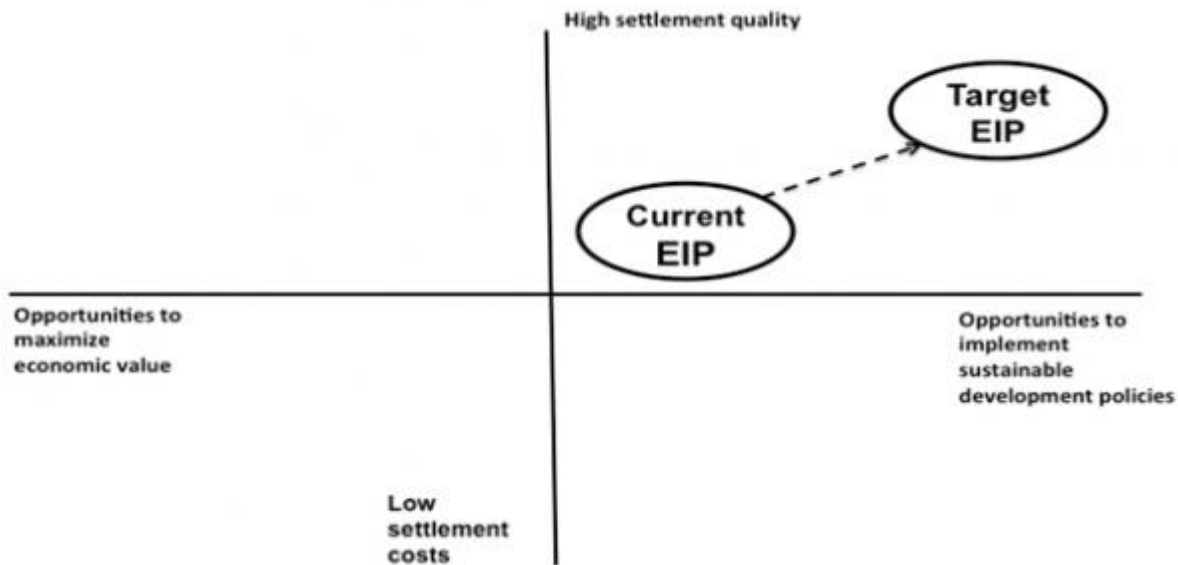


Figure 4. Target strategic positioning on cognitive map

To make believable this target positioning, four relevant conditions should be considered:

- Rich portfolio of environmental infrastructures;
- Presence of a leader-firm within the park;
- High expertise of management;
- Presence of an ambitious EIP strategic plan.

EIP value proposition

The value proposition explains the reason why target demand chooses a specific product and is able to pay the required price. It answers the questions: “Which are the needs of target demand satisfied through the specific attributes and contents of our offer?”. Looking at EIP specific case, the value proposition explains why customers (potential newcomers and involved firms) settle their units and realize their activities within park, and local stakeholders support financially and strategically park development.

To better develop an effective value proposition for EIP, the starting point is to understand the main needs (key strategic factors) of target demand and how competitors’ offers satisfy them. As shown in the previous paragraph, Eco-Industrial Parks attract two different types of target demand. So, two specific value propositions have to be prepared.

Regarding potential newcomers and involved firms, there are three main key strategic factors:

1. Availability of high quality services;
2. High price/quality ratio of inputs;

3. Low settlement costs.

To give an answer to these factors, EIPs create value through:

- The increase of efficiency and the reduction of environmental externalities;
- The improvement of environmental sustainability of involved firms with a positive effect on their external image;
- The presence of a unique and high-qualified unit that manages environmental, administrative, and technical issues;
- Financial incentives and benefits;
- The web of interactions between firms and local authorities;
- The sharing of knowledge, innovations, infrastructures, and costs;
- The involvement in the implementation of local policies for the sustainable development of place.

In addition, firms can achieve also positive economic advantages through location (getting opportunities unavailable somewhere else) and agglomeration (spillover effects) economies. Switching the attention to the other target demand (local stakeholders), the key success factors are:

1. High quality of involved firms;
2. The availability of involved firms to create shared value with local actors;
3. The integration mechanisms between involved firms and local actors.

In these directions EIPs contribute as:

- An important tool to realize the sustainable development creating benefits for firms, local stakeholders and wider local community;
- A tool to improve the attractiveness of place especially regarding green economy;
- An instrument to improve the competitiveness of place and its ability to hold firms back;
- A community where financial incentives and tax benefits for involved firms can be tested;
- A community where public-private partnerships can be designed and realized.

Product

EIP represents a complex place product, composed by three main elements (infrastructures, common services, and specific goals), and in addition by a fourth cross element (the set of involved firms). The first element is the amount of environmental, communication and logistic infrastructures shared within the park. Common services are related to the access to shared environmental infrastructures, to R&D centers/projects, to benefits to optimize environmental impacts on productive activities, and to foster the creation of a web of interaction among firms. Finally, specific goals are related to the reduction of environmental externalities, to “ad-hoc” incentives, to the reinforcement of firm’s image and social capital (relationships). These three elements generate benefits for involved and target firms by:

- Reducing energy/water consumption, garbage disposal costs, bureaucratic costs/time;
- Achieving value added services and tax break, benefits, and incentives;
- Improving firm perceived image;
- Being part of a “Community” (scale economy and social capital).

The fourth cross element is related to the attributes of involved firms, to environmental projects realized within the park, and the intensity of firm interactions. It generates benefits to involved and target firms in terms of:

- Knowledge and competence transfer;
- Agglomeration economies;
- Partner in innovative and environmental projects;
- Access to waste internal market and garbage disposal.

These benefits create value for target firms, if they are relevant and perceivable. Relevancy means that EIP benefits have a strong impact on firms’ competitiveness. Perceivable means that firms have to understand clearly these benefits and their impact on competitive advantage.

Moreover, EIP is a part of a geographical place and strongly related to local institutions (province, region, national authorities, etc.) and to the system of local EIPs. The attractiveness of EIP is influenced by attractiveness and attributes (material and immaterial) of place in which EIP is. The material and immaterial attributes are exogenous factors, that are able to influence EIP attractiveness and marketing plan. They can impact prominently the results gained from marketing initiatives, even if they cannot be enhanced. Thus, a huge integration between the marketing plans at EIP and regional/province level is required. Each EIP stands out for three main attributes:

- The peculiarities of the involved firms, and especially of the leader one;
- The expertise of the managing authority (or leader firm);

- The web of interactions among internal and external firms.

Price

There are two main determinants of price for EIP: costs of the area, and costs of services. Its determination starts from the analysis of EIP development costs, that use to be greater than classic industrial estates due to: higher planning fees, mandatory infrastructures for water recycling and reuse, and lower land index (more greenery than buildings). These costs are increased by costs of services. In an EIP the involved firms can access to many value added services, that are relatively expensive. Thereby, for firms settlement costs in EIP are about 20-25% higher than in other industrial parks. The perception of these costs is initially negative in comparison to costs to be outside the park. So, marketing plan is aimed to reduce this negative perception. Three main mechanisms can be used: tax breaks and/or financial benefits for environmental initiatives; highlighting of less environmental obligations, that reduce settlement costs (settlement costs as investments in firm image, environmental improvement, environmental local taxes, etc.); availability of common environmental infrastructures and services (otherwise firms should buy or build these infrastructures and services by themselves). Through the first mechanism, EIP offers to potential members financial incentives to reduce settlement costs or favourable credit terms for environmental investments. The other two mechanisms are strongly related to EIP communication skills. So, the second mechanism concerns the perception of EIP as a place where firms can reduce environmental obligations/taxes, negative externalities, and costs of excessive regulation (red-tape). These cost savings can justify higher settlement costs. Finally, the third one is related to the amount of available infrastructures and services, showing clearly the opportunity cost of these infrastructures and services within the park (settlement costs) compared with same ones outside.

Promotion

The promotion plan of EIP defines targets, contents, communications tools, and potential partners. Targets are firms (involved firms or potential newcomers), local stakeholders (institutions, local authorities, trade associations, etc.), and key “influencers” (opinion leaders, national and international communications media). Towards firms communication aims to show direct and indirect benefits of EIP; towards local stakeholders to underline the positive environmental impacts of productive activities within parks; towards key “influencers” to promote EIP model as a best practice to reduce negative externalities of productive activities and to foster firm competitive advantage in the long run. The contents of EIP promotion are relate to:

- The unique environmental infrastructures, facilities and services respect to other industrial parks;
- Environmental and financial benefits of EIP to balance higher settlement costs;
- The environmental impact of productive activities realized inside;
- The EIP project to optimize sustainable development and firm competitiveness.

Targets perceive differently the importance degree of these contents.

	Firms	Local Stakeholders	Key influencers
Environmental and financial benefits of EIP to balance higher settlement costs	*****	**	****
The environmental impact of productive activities realized inside	***	*****	*****
The unique environmental infrastructures, facilities and services respect to other industrial parks	*****	***	****
The EIP project to optimize sustainable development and firm competitiveness	****	****	*****

Figure 5. Contents-targets matrix

Communication tools are one to many (advertising, sponsorships, merchandising, propaganda, internet, fairs/exhibits/events) and one to one (contact center and direct one to one relations with institutions, authorities, etc.). Regarding EIP, the more effective tools are one to one, while among one to many tools events, fairs, exhibits and Internet play an important role.

The potential partners are strictly related to the place where EIP is. They are especially local authorities, Universities, R&D centers, trade associations, but also involved firms.

NOTES

1. Department of Economics, Luiss University
2. Department of Economics, Luiss University
3. "The concept of shared value can be defined as policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. Shared value creation focuses on identifying and expanding the connections between societal and economic progress" (Porter & Kramer, 2011, p. 66).

2.6 Promoting Green Logistics and Mobility Management

Valeria STACCHINI^[1]

2.6.1 What is "green logistics"?

According to the most common definition, logistics consists of "the planning, organisation, management, execution and control of freight transport operations. It embeds individual transport acts in door-to-door supply chains and involves the integration of information, transport, inventory, warehousing, materials handling, packaging and even security activities". Transport management constitutes a significant portion of logistics activity and it is responsible for GHG emissions (13,1%) more than other activities are. Therefore to act on transport system potentially means to achieve greater emission reductions and so lower negative environmental impacts.

At the European level, logistics is considered the “oil of industrial machinery” with particular reference to the Mediterranean regional system, composed mostly by cluster of small and medium enterprises working in close relationship, whose social life depends on the efficiency of transport systems and whose survival is played in large part on the ability to accelerate the rate of logistics innovation. Transport and logistics represent critical components for the success of an economy. The issue of environmental sustainability has recently evolved, changing from a purely ecological concept to an opportunity for businesses to create a competitive advantage.

2.6.2 Logistics and sustainability: lacks awareness

Logistics is a key element to compete. SMEs (which count for 90% of the productive fabric of the Mediterranean) often run their own transport or, in behalf of third parties, make use of owner-operators. Overall this creates an inefficient logistics system. Small entrepreneurs do not have awareness of this: they do not know how the cost of transport impacts on the final price of their product. Often the same actors and expert involved in the planning and management of industrial estates are not aware of the results that could be achieved with an integrated logistics management in terms of reducing the impact and how this can contribute to compete in the markets. Not to mention the environmental impacts generated by this inefficient system in terms of energy consumption, emission into the atmosphere, etc. Similarly the local authorities does not have effective policies and instruments to counter the negative externalities caused by an inefficient transport management. Without awareness and appropriate tools it is difficult to break up this system.

The “Macro-benchmarking Study” carried out in the framework of MER project, confirms this: the vast majority of the cases studies analysed (33 cases in the Mediterranean area, including Technological Parks, Industrial Parks, Industrial areas) are not dealing with problems regarding the sustainability of freight transport, even if they suffer for road congestion, limited parking spaces and problems with the connection to the city centre. Moreover the majority of respondents replied negative, when asked if there are any foreseen improvements. However some of the parks, such as Ypsonas Industrial Estate in Cyprus and Hal Far Industrial Estate in Malta are located near to terminals (port, airport, train terminals, etc.); this fact helps to reduce the truck movements, as well the traffic congestion, transportation costs and negative environmental impacts. With regard to the mobility of people, some interesting initiatives has been detected at the area's level: common workers' transportation plan and sustainable mobility program such as the three parks in France (Zone Industrielle départementale de Carros-Le-Broc, Parc d'Activités du Plateau de Signes, Aromagrasse).

2.6.3 The strategic importance of logistics in future trends

Too often sustainability has been considered as a cost for businesses. Entrepreneurs have been used to consider the investments in sustainable technologies and the innovation to reduce environmental impact as a hit on their bottom line. This isn't the case. Sustainability drives efficiency – and this is particularly true in supply chain logistics.

The leading logistics company, Deutsch Post DHL has staked out a clear position outlined in the study *"Delivering tomorrow. Towards Sustainable Logistics" (2010)*. Which are the future trends emerging from this research? Here are some key issues:

- Logistics counts – it is not a commodity. Logistics is not only a chief catalyst of global trade and a defining component behind value creation – it is also a business of strategic importance in the move toward a low-carbon economy.
- Collaboration will increasingly be seen as an enabler to attain sustainability. Even erstwhile competitors will cooperate more closely. As carbon-emission reduction becomes a priority for suppliers, business customers and logistics companies, cooperative business models will expand both vertically and horizontally along the supply chain.
- Business models of logistics companies will change as sustainable innovations open up new opportunities.

Increasing numbers of customers are now demanding energy-efficient supply chains from their logistics providers. These customers will not accept just estimates. Rather, they want reliable numbers and specific improvement ideas.

Despite the global recession, many large third-party logistics providers increased their respective commitments to developing more sustainable programs. The report sponsored by Penske Logistics and authored by Dr. Robert C. Lieb (Professor of Supply Chain Management at Northeastern University) and Dr. Kristin J. Lieb (Assistant Professor of Marketing Communication, Emerson College), indicates that CEOs were dedicated not only to providing customers with more environmentally friendly services, but also to applying such practices internally within their organizations. Corporate sustainability programs gave overwhelmingly positive results for 28 out of the 35 CEOs surveyed, including reduced operating expenses, positive impacts on company employees, substantial savings in fuel costs, and even reduced fuel costs by 40 percent, as noted by one CEO. Six CEOs reported that company sustainability efforts led to increased business with both existing and new customers. However, despite these investments, most CEOs noted that sustainability was very infrequently a determining factor in either extending existing contracts, or securing new third-party logistics business.

To give an example, the group Deutsch Post DHL has included environmental protection among the 3 pillars of their social responsibility policy, and has set itself the target of reducing its CO₂ emissions of 30% by 2020. Since 2008, the year of the launch of the program "GoGreen", DHL has already reduced its emissions of 16%, more than half of the total expected target.

Large third-party logistics providers are head of the game; they appear to be planning the long term by recognizing emerging customer preferences and providing services consistent with them. But, instead, what does it happen at the level of small and medium enterprises?

2.6.4 A research to explore the logistics needs of SMEs

In 2011, the Province of Bologna carried out a research to provide an overview of trends and main issues in European logistics sector, with particular attention to environmental and economic impacts.

The analysis shows that the topic is very complex and many different factors have an influence on logistics. Some are directly linked to production while others relate to market trends. On one hand the consumers become more aware of environmental issues and global warming and pay attention to the manufacturing processes and supply chains, the size of enterprises carbon footprint and to they recycle. On the other hand now many companies have shown that there is a link between improved environmental performance and financial gains. Examining their supply chains, they have found areas where operational improvements can produce profits, re-evaluating a company's supply chain, from purchasing, planning, and managing the use of materials to shipping and distributing finished products, savings can be seen as the benefit of implementing green policies.

The study considers also an institutional perspective and highlights that policies play a key role in determining the state of the environment.

In addition to an analysis of secondary sources, a survey was carried out in order to explore the logistics needs of SMEs. The research was carried out on a universe of 392 companies located in two industrial areas with a number of 150 contacts (40%). The analysis was carried out on a a fifth (1/5) of the contacts made. The study highlights some SMEs weaknesses:

- 82% of companies doesn't have a Logistics Manager;
- only 30% of interviewees saturates its own means more than 70%;
- 65% of surveyed companies doesn't know the impact of freight costs on the final product cost;
- 80% of enterprise doesn't employ software systems to plan and manage the logistic activities.

Reviewing the most relevant measures to achieve 'sustainable logistics' and some best practices related to them and analysing two industrial areas located in the Province of Bologna, the study identifies some innovative services that could be implemented to face the challenge of reducing GHG emissions from the logistics sector. The study demonstrates that there is no silver bullet that will radically transform logistics into a carbon-free business overnight, but a number of important factors will speed up the evolution. Among other factors, sustainability in logistics in the coming years will most likely be shaped by four key developments:

- logistics is business of strategic importance in the move towards a low-carbon economy
- collaboration among enterprises and local governments is increasingly seen as a key factor to achieve sustainability
- technology innovation applied on logistics can provide important sustainable solutions
- implementation of horizontal action such as collaboration between partners from science and research, local authorities and private business in order to minimise the impact of road transport on the climate.

Reaching this vision, however, requires to accept that no company can do it alone. Partnerships and broad collaborations are crucial to solving the greatest environmental challenges we face as businesses.

Following the results explained above, the Province of Bologna and the Ecomark partnership designed and experimented an innovative service based on an IT platform facing SMEs settled into the same industrial area.

2.6.4.1 Acting at IA's level to generate economies of scale

The service proposed is addressed essentially to SMEs located in the same industrial area and could be promoted and developed by management structures of industrial areas, business associations, development agencies and public bodies. The proximity could represent a potential factor to generate economies of scale by sharing common services and benefits of innovative facilities for know-how exchange.

A cluster of SMEs that allows to join efforts and finding synergies, compared to a single small company, has more change to find cheaper and more efficient solutions. A common management of environmental services considerably reduces the profligacy of energy, time and investments.

Collaboration among businesses and local governments is increasingly seen as a key factor to achieve sustainability. At the moment many companies are still cautious about collaborating too closely and are wary of sharing their know-how and putting sensitive data at risk.

In particular this paper aims at encouraging the companies located in the same IA to adopt a new method for managing the logistics joining synergies among them thorough the “Logistics Broker”.

Joining this service, business have to set up standards, agree on price tags and support binding regulations; on the other hands the possibility to benefit from shared services and outsourcing certain complementary activities allows companies to have a great focus on their core business.

2.6.4.2 Logistics broker: a profitable ITC service

The service designed within the Ecomark project is a brokering system based on two operative tools: a software for routes optimization and a software for loads optimization. The first one was developed by Province of Bologna, while the second one was developed within the European Project KASSETTS (founded by Central Europe Programme). The two softwares are free of charge and accessible from the Ecomark platform by registering. Using these software, the Broker (expert in logistics issues) supports the customers and the carriers in their daily transport planning.

The ‘Logistics Broker’ takes over the entire transport planning acting as a mediator between customers and carriers thanks to the software support. The Broker activity reduces also their effort of finding the best and cheapest transport solutions.

The role of the broker, already used within other European Projects, introduces important changes in the proceeding of the transport planning. The broker acts as a shared logistics office for SMEs located in an industrial area (as showed in the flow):

- collects transport orders of enterprises daily;

- organizes transport requests choosing the best vehicle routing and optimizing the load.
- interfaces the optimized request with logistics operators

The image above shows the status quo (view1): a number of small businesses that organize individually their own transports. The view 2 instead shows the aggregated transport management with the support of the logistics broker, highlighting the benefits, in terms of lower circulating vehicles, thanks to the optimization of loads, and that cover shorter routes, reducing miles traveled.

All this means: lower environmental impacts, saving for business and less congestion. However, it also means many organizational changes for both the two main actors of the service: companies and carries.

From enterprise side, customers have to use a specific platform to create a order request and this means a technological change in the organization of firms. Privacy and tricklish information posted on the platform have to be regulated. The new system introduces changes also in the relationship between customers and carries with particular reference to the choose of transport provider and the duly payment for transport service. The carries have to provide information on their price lists, vehicles size and features that are necessary to proceed an optimized transport planning, and it's necessary to introduce a new detailed design contract. Moreover the carriers have to introduce a new orders management compatible with the broker platform.

On the other hand the automation of the process prevents human errors and enables an optimal planning. The shift of the planning process from human resources to an automated platform reduces the planning effort for the customers. Due to the shorter electronic processing, both customers and carriers take advantage of decreasing costs.

2.6.4.3 Logistics Audit: an important first step toward awareness

Small and medium enterprises do not have awareness of the importance of a good and strategic logistics policy. This lack of awareness does not permit a whole management and control of their organization and a potential cost saving. To meet enterprises' needs, it may be useful, in a preliminary phase, to carry on audits in order to check up the state of the art of logistics of the companies that may be interested in the broker service.

A team of experts analyses the logistics and transport habits of each enterprises interested in and provides them a report on the state of the art and on the potential area of optimization and saving. The enterprises are asked to provide information on their logistics habits and a detailed list of the purchasing and arranging inbound movement of materials, parts and/or finished inventory from suppliers to manufacturing and of the storage and movement of the final product to the end user. The team of experts analyses these data using the IT platform and simulating the potential saving generated in case of implementing an aggregated transport management.

However, in order to increase awareness in businesses of the importance of logistics and its sustainable management, Eco-scp-med project, developed an easy-to-use tool summarizing the steps and the phases for carrying out the logistics services. It is a simple check-list facing 9 key items: cooperation with other businesses and businesses networking, cooperation with

local bodies, policies, promotion and communication, identification of IA, technological innovation, qualified human resources, creation of an expert board, quality assessment.

2.6.4.4 The results from the tests

The Province of Bologna, in the framework of Ecomark project, has tested the broker service in the industrial area of Budrio (20 km east of Bologna, with a total area of 158 hectares). The Province organized several meetings and workshops to introduce the service, first involving trade unions and then businesses of the IAs. Finally 8 businesses joined the pilot service; of course it was checked the compatibility of the goods and it was tested non-competition between companies to get a neighbour collaboration. A team of experts analysed the logistics and transport habits of each enterprise and provided them a report on the state of the art and on the potential area of optimization. The report provided a forecast of the saving that the company could obtain thanks to aggregation of the transport demand, highlighting the potential reduction in km covered and cost per km both in case of aggregation of transport and in case of own transport management.

The SMEs provided 1.638 transport orders referred to 15 days. It was possible to aggregate 15% of transport orders. This generated a good saturation coefficient (+3%) on weight, volume and surface, a consistent reduction of kilometres covered (-20.000km and -300h spent on road), and a appealing cost reduction (-6,5%), as shown in the following histogram.

Cost reduction has been calculated considering both costs relating to the transportation itself, and the missing charges for related activities of the organization and management of transport.

The results of the experimentation, which will surely be enhanced by a long-term research on a larger sample of enterprises, highlight the advantages of an aggregated management and optimized transport for SMEs, able to cope with the main problems of the Mediterranean transport system: massive presence of goods transported by road, mainly local character of traffic (more than half of the goods covered distances less than 50 km), and poor optimization of the vehicles loading, especially those made in their own (less than a half of the vehicles exploits the actual carrying capacity of the medium).

2.6.4.5 A process win-win-win

In Italy, but similar situations can be found a bit 'all over the Mediterranean, the transport for third parties is largely a minority (approximately 38%) compared to logistics managed by businesses on their own, and it still sees the predominance of small and very small companies. Freight transport on one own account turns out to be, on average, less technically efficient form of transport: does not optimize routes, load factors has generally low, do not use technologies for monitoring processes. In third parties transport are also very popular micro-enterprises, the so called owner-operators, companies in which the truck driver is the owner of the vehicle. These companies maintain a size craft and often are compressed by an increase in costs and a demand for flexibility is not always easy to manage. Overall this creates an inefficient logistics system. To rely on a skilled person, the broker, who is able to offer a service and a counselling, aimed at optimizing the logistics and transports at the level of

industrial area, means to generate economies of scale, to create additional value and to compete at this particular negative phase of the economic cycle.

The introduction of ITC system is no further procrastinable in order to stay in increasingly global and competitive markets: the application of new technologies can bring considerable and concrete benefits both to small businesses and communities, limiting the number of vehicles in circulation and therefore the emissions. Similarly it is possible to introduce services at IA's level in order to encourage a sustainable mobility of people, such as tools for the spread of car pooling or car sharing, just as an example.

The path towards sustainability should be a win-win-win process. The companies and their suppliers save money, and this may also be reflected on the final consumer; the processes through ITC supports are faster, communities can benefit from less congestion and the less problems that come with it. Building a sustainable supply-chain turns out to be an opportunity that companies can not miss for the improvement of their competitiveness. It is both a difficult and complex challenge, to be addressed with rigour and willingness in order to respond to the ever-changing context and the solutions needed to give substance to the commitment to contribute to sustainable development. The key issue is collaboration.

These will be the challenges of the future that firms will have to face.

NOTES

1. Province of Bologna

Part 3 Key Issues in Fostering Eco-Innovative Industrial Areas and Enterprise Zones

3.1 PV Solar Plan for Industrial Areas in Malta

Giovanni MANCO, Stefano MUGNOZ

3.1.1 Introduction

Malta can be considered as an atypical case in the European scenario of RES since it is one of the most urbanized nations in the world with around 30% of its territory already built. It is almost one of the smallest countries with an area of 316km².

The position of the Maltese Islands provides a high energy potential from renewable sources from which a good share of green energy could derive, given the high levels of solar radiation, winds, algae and wave motion. On the other hand, Malta has an extremely sensitive territory in terms of a landscape, environmental, historical and cultural point of view that is the pillar of its economy based on tourism. Therefore the introduction of RES on the territory of Malta may require particular attention as it presents some difficulties in installation, for three main reasons:

1. Lack of large free surfaces
2. High landscape impacts
3. Some technologies are still experimental

The Maltese government is strongly committed, like in other European countries, to the achievement of the targets set by the European Community on the use of renewable sources by 2020. In fact, many Maltese institutions have in recent years participated in several European initiatives and programs (both research and cooperation) to support the search of new and more efficient technologies, the introduction RES plants, the spread of a green approach by administrators, stake-holders and citizens.

The lack of large open areas suitable for the construction of large scale plants and the need to keep intact those areas destined for agriculture have initially induced the Maltese Government to exclude photovoltaic systems as one of the main source of renewable energy production. This source was initially considered as residual and limited to small private installations. The few plants built were placed mainly on the roofs of private homes with crystalline photovoltaic panels, installed on metal frames inclined at about 30 degrees, facing south (often without respecting the architectural context) that generated a lot of resentment because of the strong visual impact limiting its diffusion.

A different approach was taken through the implementation of the European Funder project Enerscapes (funded by the MED Programme) which investigated and evaluated the impact of renewable energy plants on the landscape and has made a cultural and knowledge enrichment about possible problem solutions.

Through the identification and assessment of some scenarios at territorial scale, Enerscapes demonstrated how RES plants and in particular photovoltaics can contribute decisively to the

achievement of the European objectives, especially if introduced according to new schemes based on respect for the Maltese environment and landscape.

Those that until then were considered points of weaknesses have turned to points of strength bringing out an interesting synergy that goes to open large scenarios for "sustainable" photovoltaic plants in Malta. Current technologies allow, with a small loss on the productivity (about 10%), the construction of installations not necessarily inclined at 30° but coplanar with flat roofs of Maltese buildings, which are integrated and almost completely invisible from the ground^[1]

The significant reduction of the cost of photovoltaic modules can favor the launch this process; currently it is possible to realize an integrated photovoltaic system on the roofs, with European components, at a general cost of 2.000-2.200 €/kw. Moreover, the spread of photovoltaic on a large-scale would support the demand for energy especially in summer when the demand increases due to tourism.

Thus, considering only a part of the buildings' roofs with suitable surfaces for the installation of photovoltaic systems, Malta could easily reach its objectives in Europe without having to sacrifice the agricultural land or invest in more impacting technologies (as offshore wind mills) or immature ones (wave energy).

3.1.2 Industrial Areas

The importance of energy efficiency in buildings has in recent years reached a high level of awareness in Malta although so far the attention has been mainly focus in the tourism sector, while little has been done to address the goal of sustainability in industrial sector.

The Regulation on 'Energy Efficiency in Buildings', introduced in 2008, does not apply to industrial buildings and there is no other law or similar provision related to industrial areas.

The 2008 Malta's National Energy Efficiency Action Plan (Neeap) makes indications to the private sector and it mentions the intention to implement a number of financial support programs to promote the energy industry, energy audits, power factor correction, renewable energy source, high-efficiency motors and similar measures. However there is presently no enforcement of such measure and implementation is taking place at a very slow pace.

Many industrial sites in Malta are located on public properties and leased to private operators. Malta Industrial Parks Ltd (MIP) is the government-owned company that manages and administers all government owned industrial estates in Malta and Gozo (the major industrial parks). This supports the feasibility and possible implementation of government policies.

The solar energy Maltese context is very encouraging and this has led the government to focus strongly on the increase of photovoltaic energy in the areas where demand is greater, that is, the industrial areas and docks.

In June 2014, MIP invited investors to submit an Expression of Interest for the installation of photovoltaic panels on factory roofs in some industrial parks in Malta and Gozo, thus promoting photovoltaic plants of large and medium sizes. The notice underlines as "this will allow to reduce the dependence from the combustible fossil fuels for the production of electric energy but also to complete ahead a leap forward in the achieving the emission targets engaged".

The economic resources will be ensured by leasing the roofs to private investors for a period of at least twenty years, using criteria and tools already tested in other European countries.

The program will involve 155 industrial buildings, for a total surface of 199 454 square meters. With the full implementation of the project there will be an installation of 20 MWp of PV and the starting of a virtuous cycle for the PV energy production with future calls also for other industrial roofs.

The most innovative aspect of the notice oblige the winner(s) to remove approximately 16,571 square meters of roofs made of asbestos panels, currently present on 9 factories to be substituted with insulated sandwich panels, in compliance with the MEPA and OSHA regulations. The insulated panels will be then the support for the installation of the photovoltaic system^[2].

The notice, however, also contains some critical aspects. In fact, there are no incentives for architectural integration of the systems thus encouraging traditional solutions instead of more integrated, innovative, more expensive systems with less visual impact. Furthermore it hasn't yet defined incentives gained by investors for producing green electricity.

These were the main reasons that led to the temporary suspension of the notice on which MIP is now working to make the corrections and re-launch it.

In any case, from the strategic point of view, the consciousness that the way of clean energy and photovoltaics is the right one for Malta is definitely established.

Prime Minister Joseph Muscat has argued publicly that the government's goal is to reach 4.5% of renewable energy production set for 2016 (Malta is still at 1.5%), going beyond the issues of energy price, not underestimating the long-term benefits determined by renewable energies and by promoting the creation of green jobs.

Malta that has in the past focused on gas energy supplies, is now turning positively towards renewable energy sources and in particular solar energy as a source of clean energy.

NOTES

1. The same concept can be applied for the production of sanitary water (thermo-solar panels) in case of using thermodynamic systems.
2. On the territory of Malta there are considerable surfaces covered with asbestos panels which, as is known, release lethal particles for the human body in the air. On this subject, it would be desirable to have a government initiative for economic support to owners who wish to proceed with the removal and even more to those who want to replace them with integrated photovoltaic systems.

3.2 Coaching Local Administrative Bodies to Manage the Redevelopment of Brownfield Sites: The case of COBRAMAN project

Dr. Matej NIKŠIČ^[1]

(Graphics contributors: Loni JOVANOVIĆ and Barbara MUŠIČ)

3.2.1 Introduction

The many years' practice of revitalization of brownfield sites across Europe pointed out that a key factor for a success is a professional process management. Accordingly a need for setting up a professional discipline – the brownfield regeneration manager – was identified. Although in several countries jobs related to revitalization of brownfields exist the absence of a unique job description is evident.

Introduction of a new professional discipline in this field was the core objective of COBRAMAN project running within Interreg IVB Central Europe programme from 2008 till 2012. Nine partners from five countries (Czech Republic, Germany, Italy, Poland and Slovenia) joint their forces to facilitate the establishment of a professional brownfield management approach in local administrative bodies.



3.2.2 Brownfield regeneration manager

All over Europe revitalization of brownfield sites plays an important role within urban agendas aiming to divert the practice of urban sprawl into more sustainable forms of urban growth. Brownfields regeneration is also an important part of qualitative urban growth agendas rising the standards of urban living by combating the social and spatial segregation as well as resolving environmental risks.

Management of brownfield regeneration processes is a lengthy and complex process that requires a number of skills at strategic and operational levels. A well skilled brownfields manager has profound knowledge in the fields of management, communication, planning & design, environmental & civil engineering, real estate industry and legal & administrative processing. At a strategic level abilities of engaging the stakeholders, leading the marketing activities and considering the political agendas are demanded. At an operational level the knowhow in the fields of sustainable planning, contamination, natural assets, water management, finance and industrial heritage is a prerequisite. The widespread area of responsibility requires excellence in coordination and communication, nevertheless the role of a brownfield manager is not simply a moderating one, it is strongly target-oriented. At the same time a visionary and holistic thinking combined with managerial leadership is essential.

Tasks	Responsibilities
• Provision of relevant and well targeted information for specific groups • Identification and involvement of community/ neighbourhood and other stakeholders in redevelopment process	• “One stop shop” for internal and external stakeholders (e.g. investors as well as for site owners) • Initiator and moderator of the stakeholder engagement process
• Internal communication in the municipality, short and direct channels enable faster project results • Set-up and steering a project-specific interdisciplinary working group	• Acting as interface between policy makers, administration and the technical specialists • Coordinating information flow and work at any step in the development process
• Developing the visions/development plans, which recognize existing policy, build on local needs and expectations. • Preparation of political decisions, financial and institutional framework • Identification of potential partners • Adoption of an interdisciplinary project team approach	• Triggering the regeneration process
• Facilitating efficient project delivery • Coordination of revitalisation process including time schedule and cost management • Quality and risk management • Coordination of all works and services required	• Project manager
• Branding – building a positive image for the area under regeneration • Marketing – initiating target group specific marketing activities	• Initiator and coordinator of public relations and marketing activities

Tasks and responsibilities of a brownfield regeneration manager according to Cobraman Interreg IVB partnership

3.2.3 Approaches to brownfield regeneration across Europe

Nowadays the cities are the key players in the fields of brownfields regeneration, nevertheless an west-eastern divide can be seen in Europe at a national level. While in western countries strategic policies are to be established and the need for a professional brownfield management is broadly accepted, the central and eastern European countries have been only starting to recognize the importance of brownfield management recently. Some European policy documents such as Leipzig Charta in combination with e.g. the operational programs of EU structural funds will hopefully support the implementation of the brownfield regeneration issues in national policies further.

Setting up a Brownfield management unit within city administration structure is beneficial in terms of a well-coordinated and thus efficient work. Where to place such a unit within a pre-established sectorial and hierarchical structure of a city administration is not a key question, it is more important that it manages to establish itself as an interdepartmental working group with a clear problem-oriented action approach and act as a one-stop-shop for all stakeholders as well as owners, investors and developers. Ideally the brownfield regeneration manager acts powerfully within the horizontal networks without coincidentally challenging existing hierarchical structures.

3.2.4 Training

There are no professional or educational standards for brownfields regeneration managers in EU to date. In order to prepare graduates to manage projects related to restoration and development of abandoned sites some specific knowledge and expertise has to be absorbed during the studies. This includes knowledge and know-how in the fields of environmental assessment of brownfields, civil engineering and technical assessment, economic and socio-economical assessment, remediation and regeneration of areas and environmental protection and design.

The study program developed by the Cobraman partnership is set up on a multidisciplinary basis and combines natural, economic, constructional and technical disciplines. Graduates obtain in-depth knowledge of environmental, ecological and technical subjects, modern information technologies, database applications and European environmental legislation. The anticipated target-group are e.g. councilors, government and municipal administration employees, private sector representatives interested in investing, geographers, architects, urban planning engineers, construction engineers. Additionally to a real-time study an E-learning module was developed too and consists of five modules: Holistic approach to the revitalization, Brownfield revitalization problems, Environmental protection, Urban planning and Cultural Heritage. E-learning module is accessible at any time on-line to the widest public at <http://www.cobraman-ce.eu> in Education section.

The profound knowledge needed can be categorized in 6 groups:



Management

- General project management
- Conceptual and visionary thinking
- Leadership - strong team player
- Organisational skills



Communication

- Communication management
- Moderation, negotiation, mediation
- Marketing and campaigning
- Ability to describe even complex and multidisciplinary issues in illustrative and simple words - spokesman qualities



Planning and Design

- Landscape and urban planning
- Architecture
- Socio-economic dimension of urban development



Environmental and civil engineering

- Civil and construction engineering
- Environmental engineering, geo-technology
- Health and safety measures



Property development industry

- Basic knowledge in project financing and calculation
- Market mechanisms and trends
- Life cycle considerations of property investments



Legal and administrative aspects

- Basic knowledge in all related legal areas
- Municipal administration and structures
- Understanding of municipal decision-making processes and a keen sense of political feasibility

The profound knowledge needed by a brownfield regeneration manager



The 6-part contents of the seminar cycle developed during the Cobraman project

3.2.5 Key management tools in practice

There is a range of management instruments and tools that are applicable in the regeneration process. Cobraman partnership identified those which proved to be essential and adopted them to the regeneration business, they include (1) information support, (2) information and communication at city level, (3) information and communication at project level, (4) coordination, (5) strategy and marketing and (6) project management. Each of these tools is shortly described here after.



Public event on Stuttgart's pilot site Schoch Area

3.2.5.1 Introduction

The growing use of Renewable Energy Sources (RES) is leading to a new awareness about their compatibility with landscape and heritage preservation policies. If at national and European scale the development of RES can be considered as a positive, desirable and necessary development, the local scale is challenged in terms of changes of territorial assets, especially regarding ecological and cultural landscapes. The RES market growth, if not suitably regulated, while on the one hand it may cause the increase of the overall energy production, on the other hand it may induce a decrease in competitiveness in terms of attractiveness, strictly related to landscape assets. Thus a region that aims to become more competitive and sustainable, needs to carry on both RES system implementation and territorial preservation, and hence to look for a good balance between all these growth factors. The Enerscapes project investigates the opportunity of balancing these issues by developing a methodology for landscapes assessment in introducing the RES in Mediterranean territories. The Enerscapes methodology perfectly fits with the aims of the MER project, in particular for the development of new sustainable industrial areas in which the environmental and landscape issues are important for the area planning and the impacts of the RES equipments could have a relevant role.

The greatest need for information in the revitalization process is during the initial planning phase when the key decisions are made. It is important to have all relevant information at hand fast and clearly. The appropriate amount of relevant data reduces the risk associated with a decision. The most useful information at this stage proves to be the information about the subject of revitalization and the process related information. The database of the previous successes and failures in revitalization processes proves to be a valuable source upon which the decisions can be made in an easier way. One of the results of Cobraman project is the database gathering information on redevelopment projects in Central Europe. It contains key information on significant brownfield projects, explains specific tools used in each case, describes localities into details by giving coordinates and accessibility information, giving insight into environmental issues and presenting the case by maps, photo materials and other relevant documents.

3.2.5.2 GIS-related information system

Brownfield manager needs an insight and overview of any relevant topic related to the project at any time. Therefor the information has to be stored in a way that allows a fast and easy access to different information layers and enables their simultaneous comparison and analysis. Integration of information into a geographical information system in a clear and well- structured way becomes a valuable tool not only in the decision making processes but also a mean of promotion to increase the chances of attracting investors. At the same time it serves as inventorial and statistical tool for the owners of the plots to be revitalized and allows easy analysis of a huge amount of data in order to produce useful conclusions. Another strength of GIS database is easy production of visualisations that can be adjusted to various publics from decision makers, potential investors to general publics and future users of place. In the examples of a good practice the GIS layers are contributed and managed in a common database by various departments of city administration and other relevant institutions and bodies, which allows a brownfield manager to be instantly up-to-date with any relevant aspect of the revitalization process.



Brownfield site in the City of Ústí nad Labem (Czech Republic)

3.2.5.3 Site review

Throughout the process of revitalization various parties will be producing a multitude of information, planning documents, technical reports etc. Keeping the overview, structuring and filing, assessing according to relevance and target groups as well as drawing appropriate conclusions are fundamental tasks to ensure the information flow within the project. The Site review is a mother document outlining and summarizing all relevant aspects. It is also a linkage to the wealth of existing specific documents. As an internal document it is continuously updated with the information of any member of the working group. By doing so it helps members of a group to keep the same level of knowledge. The main structure of such a document-in-progress consists of the following sections: Rationale and goals, Project site and its main characteristics, Surroundings of a site, Historical and current use of the site, Development conflicts and constraints, Current state of planning, Existing reports and studies, Ongoing activities, Visions and potentials, Environmental ID (contamination, waste, geotechnical aspects, social infrastructure), Technical activities needed to prepare land for building, Impact assessment of building activities, finances and marketing, Time schedule, Summary and conclusions and Bibliography including guide to project documentation.

3.2.5.4 Interdisciplinary working group

Interdisciplinary approach to brownfield revitalization is a basal condition for a final success. This means a composition of various departments and specialists working jointly towards a common goal. As always in the case of diverse working group the firm coordination of manifold activities is needed. A setting up of a formal statute of the working group is recommended in order to outline the common understanding of the key aspects of the process, such as aims, objectives and lifetime of the project, membership, representation and participation, competences and duties of the members, rules for decision making as well as management body (chair, secretariat). The more responsibilities and decision-making power can be assigned from different departments to such a group, the more effective the work of the members of the group will be. It is a key role of the regeneration manager to take over the chair or secretariat of the working group.

3.2.5.5 Brownfield SWOT

SWOT Analysis is a strategic planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in the project, including the business venture associated with it. It helps to identify the attributes that are supportive or harmful to meeting the objectives, as well as external conditions that are helpful or could damage to achieve the objectives. SWOT analysis is an important step in the process as new steps and directions can derive from it. Normally the brownfield SWOT analysis would cover the microsite aspects (current and future use, financial issues, social and cultural aspects), macrosite aspects (neighborhood uses, transport and other infrastructure, market situation and competitors) and stakeholder engagement (owners, investors, citizens, politicians and alike). The third category is considered to be essential and superposing the micro and macro site aspects as the strength of the interests and of the voices of certain stakeholders will define the progress in regeneration process.

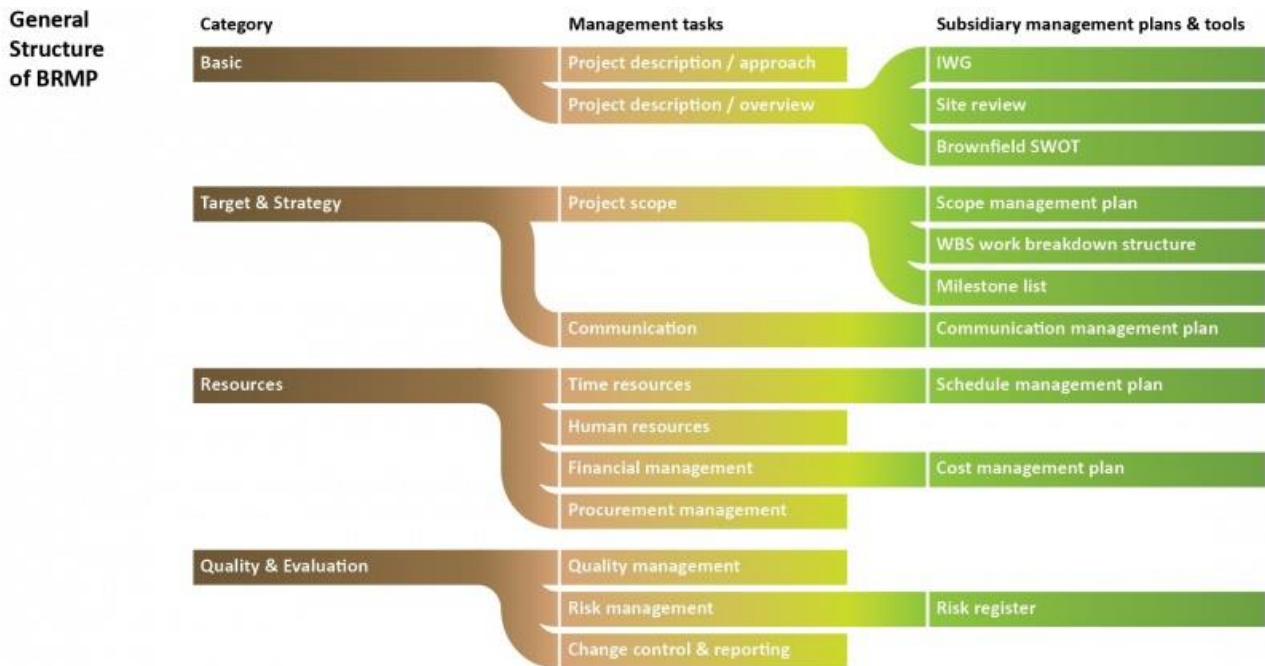
3.2.5.6 Brownfield regeneration management plan

Similarly as a classical project management plan this plan is a formally approved document that defines how the redevelopment project will be executed, monitored and controlled. Depending on the complexity of the issues it can be supplemented by subsidiary management plans or other planning documents. It serves as a roadmap for all project team members. Once agreed and approved by at least the project team and the key stakeholders it becomes a binding framework for all activities during the redevelopment process. The clear and broadly accepted definition of objectives, structures and work flows is essential for a successful completion of the regeneration and the document is a core point of reference to assist it. The length of the processes or technical risks and related modifications may imply changing boundary conditions, entrance of new stakeholders or substantial shifts in stakeholder's attitudes toward the development and sometimes hamper the setup of well-defined management plans, on the other hand they underline the particular importance of their strict application. According to Cobraman partnership it is advisable to structure the document into four main categories:

- Basic (project description – approach and overview)

- Target & strategy (project scope, communication)
- Resources (time resources, human resources, financial management, procurement management)
- Quality and evaluation (quality management, risk management, change control & reporting)

Each category comprises of several aspects which have to be taken into consideration in the management of a brownfield regeneration process. Cobraman partnership illustrated them with a series of pilot projects that are described into the details in a web-accessible database at <http://www.cobraman-ce.eu/>.



General structure of Brownfield regeneration management plan (BRMP)

3.2.6 Conclusion

Revitalization of brownfield areas is an essential aspect of a contemporary (re)urbanization processes. By improving environmental, functional and structural conditions it not only contributes to the improved living conditions in the cities, but has a range of positive effects in social and economic terms by bringing new jobs and activities back to the city. It sets up a new life-cycle to the areas that once already served the city but declined into a neglect due to the inappropriate respond to the challenges of time. The proper revitalization process equips the urban area with a more robust structure that can better respond to the future challenges and pressures – it is this long-term successfulness that determines an exemplary brownfield regeneration. Reuse of abandoned industrial sites for the new production uses on the improved environmental and energy-efficiency basis is a prime example of such an endeavour.



Right knowledge and skills can turn brownfields into prosperous environments again

NOTES

1. Urban Planning Institute of the Republic of Slovenia

3.3 Promoting knowledge intensive activities for economic growth

Juan Pablo TORREGROSA^[1], Yolanda NICOLAU^[2]

3.3.1 Introduction

As the European Union continues to experience considerable economic challenges, it remains essential that the regions closely examine the role of innovation, knowledge and creativity for their future economic prosperity.

Despite recognition in high profile European policies and strategies (e.g. Europe 2020) that creativity and innovation supports economic growth, significant gaps currently exist in regional innovation policies, actors and tools across regions of the Mediterranean that could hinder economic development. Recognizing that regional prosperity depends on a region's capacity to support innovative businesses, institutions and people, try to identify and outline key issues to address in order to close gaps in innovation in their own territories. Issues include:

- Improve governance of innovation needs;

- Enhance cooperation of key institutional and economic actors in terms of creating new territorial development policies;
- Promote our knowledge economy through a new transnational dialogue-platform on policies, tools and strategies that attract and generate innovation and creativity;
- Encourage new creative clusters and to internationalize knowledge-intensive businesses.

The “Knowledge Intelligence and Innovation for a sustainable Growth-KnowInG” funded by the STC programme MED, Axe 1: Strengthening innovation capacities, in the Objective 1.2: Strengthening strategic cooperation between economic development actors and public authorities addressed aforementioned issues, while also considered the necessity of moving away from the traditional, physical-based industries, to the more current knowledge-based sectors (e.g. technology and creative sectors), which support economic growth. Subsequently, this shift in the economy’s perspective will lead to the growing need for creative and innovation clusters, which make mutual links at regional, transnational and international level so businesses can share, learn, create and innovate with each other.

The KnowInG Project considered the above and other key factors as the project partners examined regional policies and existing actors and tools that support innovation and creativity across key industries including ceramics, renewable energy, cultural tourism and video gaming. Partners also implemented a range of activities in order to test the KnowInG Project’s approach that knowledge intensive activities (or creative or knowledge clusters) drive economic growth. These included capitalization seminars, a transnational Helpdesk for SMEs, creative laboratories for young people and online resources for businesses.

Overall, it has to be mentioned that current economic exchanges are moving away from the traditional national scale of governance. This is crucially linked to changes in production and trade, which are increasingly associated with knowledge-based activities.

Nowadays, technology and knowledge are the key factors of production. Mobility of information has increased and a global workforce has developed, resulting in knowledge and expertise being transported instantaneously around the world. This has also impacted on commercial competition; any advantage gained by one company can be eliminated overnight by rapid, competitive improvements. Also, since we are now an information society, knowledge management is absolutely essential for economic growth.

Ideally, companies need to take a strategic look at the following elements in order to stay ahead of the curve and gain a competitive advantage over their counterparts by focusing on:

- Their process of innovation;
- Combining market and technology;
- Supporting know-how and creative talents of knowledge workers;
- Their ability to derive value from information.

The knowledge economy comprises economic synergies across multiple economic sectors such as the industries that develop from individual creativity, skill and talent, and have potential for wealth and job creation. These creative industries, directly or indirectly, produce cultural products and include commercial enterprises as well as artistic, public and not-for-profit organizations.

Those issues provided the inspiration for KnowInG Project and might as well become an inspiration for promoting economic growth through promoting knowledge intensive activities.

3.3.2 Support for European innovation and creativity as an economic driving force

In the context of the Lisbon Strategy that aimed to encourage scientific and technological innovation, the European Commission underlined the importance of creativity: if knowledge is seen as “the motor of the sustainable growth”, then “education and research, innovation and creativity are the keywords for a high-speed transformation world”. The same keywords are re-proposed in the 2020 Strategy, for future years.

Similar directions by the European Union also apply for regional policies: it is necessary to take care of and to pay attention to the creative industries, because they have positive repercussions on other sectors. Some key concepts that have been expressed for incentivizing the creative industries comprise the following:

- Attract talent;
- Stimulate interaction between culture, development and territory;
- Support networking;
- Coordinate between institutions;
- Develop of planning skills;
- Select services and beneficiaries;
- Valorize their territory on a global level;
- Improve collaboration between research and business;
- Put more value on the significance of skills enhancement, education and training.

Since innovation and creativity have become a key vehicle for economic growth in Europe, Knowledge-intensive activities (i.e. knowledge or creative clusters) are of growing importance within the innovation and enterprise landscapes. These activities comprise cultural industries, high-tech branches, higher education institutions, research centers and advanced producer services. In Europe, regional knowledge clusters are seen as key drivers for competitiveness, innovation and regional development. Therefore, they are promoted through national and regional-level measures and through EU-level support instruments. The KnowInG Project partners across regions in the Mediterranean and in the UK were tasked with examining these knowledge-intensive activities and opportunities for cluster development at national and regional level in order to identify potential for economic growth via innovation and knowledge, as well as barriers to growth. Key areas of education and job creation were also examined.

The findings are set out in three reports focusing on Policies, Actors and Tools. Those reports are available through the project’s website http://www.knowing-project.eu/index.php?option=com_content&view=article&id=151&Itemid=63&lang=en.

Special focus should be given though on the Tools developed in the framework of the KnowInG Project, as they are easily replicable for promoting European innovation and creativity at regional level.

3.3.3 Innovation tools developed or organized by the KnowInG Project

The KnowInG Project partners produced new tools ranging from local to transnational level. Although many tools were already available in various regions, before the launch of the KnowInG Project, including some regions not involved in the project, the partners organized and improved the accessibility to such existing tools (see details in the following tables).

The new transnational Helpdesks provided a variety of useful support services for entrepreneurs in each territory. Users were able to source expert information and consultancy on issues such as internationalization, tender bids, technology transfer, best practice and project partner-matching services.

With the aim of filling gaps in the scope of existing tools the KnowInG Project partners developed and implemented their own tools, in order to boost innovation and, therefore, economic growth. These included stand-alone events such as creative laboratories, capitalization seminars and capacity building workshops. Stakeholders also had access to social networks to get more involved in the KnowInG Project's developments.

Examples include Spain's tools that focused on the area of renewable energy and energy efficiency for the development of rural areas, comprising dissemination events and knowledge transfer within the industry. The focus of Valencia region itself was also on energy field (Innovative initiatives for the sustainable development of rural areas based on an intelligent use of energy), as renewable energy sector is considered one of the main emerging sectors, which is able to develop and consolidate the industrial sector by generating new high value jobs and new business. Furthermore, the focus was also on innovative initiatives that may support the sustainable development of rural areas through the intelligent use of energy.

Examples of tools and activities for creativity and innovation related to energy field in the Valencia Region as identified by the Valencia KnowInG Project Partners

NAME OF TOOL	NAME OF TOOL
Emprenemjunts - Business Innovation Centre of Valencia	Business Support
CATEGORY SERVICE: Business innovation centre	CATEGORY SERVICE: Help Desk- Business Support
AIMS AND GOALS The tool aims to:	AIMS AND GOALS Business support and advice for entrepreneurs and enterprises.
- Promote and encourage entrepreneurship, values and principles; - Pool the greatest number of interested organizations, companies and entrepreneurs; - Promote entrepreneurship and strengthen the Valencian support	ORGANIZER AND USERS Organizer: CEEI Users: Entrepreneurs, companies, etc.
	TOOL'S IMPACTS CEEI Valencia has supported entrepreneurs and enterprises to develop their Business, Marketing and Executive Plan. 6

system for entrepreneurs. ORGANIZER AND USERS Organizer: Valencia Region and IVACE. Users: Organizations, companies and entrepreneurs. TOOL'S IMPACTS Emprenemjunts is an online reference portal that brings together the support of agents of Valencian entrepreneurship and directs online visitors to various websites related to this area. It also enables different agents to improve the efficiency of resources used in this field, resulting in additional benefit to the users. As an institutional cooperation project, all partners contribute information and content to the online databases on a voluntary basis. They can also extract information and content; prepare customized presentations on a thematic or territorial basis. The web platform also gathers entities, business and entrepreneurs, promoting cooperation. The web portal offers entrepreneurs relevant information, articles, activities and re-sources across 14 different sections. WEBSITE www.emprenemjunts.es	entrepreneurs have been advised and supported in their Business Plans based on energy. WEBSITE www.ceei-valencia.com http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=7471
NAME OF TOOL Valencia Region Brochure CATEGORY SERVICE: Dissemination AIMS AND GOALS Regional Bruchure as a summary of our Knowing focus To capitalize the results of the project carried out in Valencia and to disseminate good practices in the field of energy. ORGANIZER AND USERS Organizer: Valencia Partners-FVMP and CEEI Users: households, businesses and Valencia	NAME OF TOOL Valencia Region Settlement Plan CATEGORY SERVICE: Settlement Plan AIMS AND GOALS This tool aimed to stimulate the mobility of individuals and enterprises operating in the knowledge economy into and towards the MED area. Interested users were invited to to receive a supporting plan of business settlement from the local/ regional authorities (i.e. KnowInG Project partners). The plan consists of administrative, structural and credit facilities.

municipalities

TOOL'S

It is composed of a short description of renewable energy: geothermal, solar, wind and biomass. And best practices in the field of saving and energy-efficiency easily applicable by households, businesses and municipalities.

WEBSITE

<http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=7470>

IMPACTS

Valencia Knowing partners developed a Settlement Plan for interested companies in being established in Valencia Region, this Settlement Plan inform about tools and services available. In the case of Valencia Region, CEEI Valencia has also enhanced several mini-guides, Business Activity Cards, to facilitate the settlement of business, these Business Activity Cards are small sectorized market research used to give an overview of each subsector in the energy field to companies interested in establishing in Valencia or cooperate with Valencian companies

ORGANIZER AND USERS

Organizer: CEEI Valencia and FVMP
Users: Entrepreneurs, enterprises, etc.

TOOL'S

Valencia Partners developed this Settlement Plan of Valencia Region, and CEEI Valencia has developed 5 Business Activity Cards with a short market studies related to energy field (Bioenergy, Environmental Consulting, Photovoltaic Energy Installation Company, Technical Office of Environmental Engineering, and Waste Treatment)

WEBSITE

<http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=7192>

<http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=7190>

<http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=71901>

<http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=7189>

<http://ceeivalencia.emprenemjunts.es/index.php?op=13&n=7188>

NAME OF TOOL

Laboratories of Creativeness

Introduction

We aimed to generate innovative measures to raise awareness on energy issues, principally addressed to housewives, farmers, municipalities and micro SMEs, in order to increase energy sustainability of rural areas in the Valencia Region and promote their dynamization through the knowledge economy.

The Focus intended to increase energy sustainability of these areas and describe from an innovative approach, alternatives in energy production and better use of energy through good practices and use of renewable energies and energy efficiency

It is important to highlight that when dealing with energy, we are not only thinking about traditional renewable energy systems but a more innovative approach.

We took into account the whole value chain of energy, which is production and consumption, and the way final users daily life may become more sustainable, while offering rural areas an innovative way to assure a sustainable development of their activities.

Thus, the Laboratories allowed to gather and to share, among stakeholders, good practices in order to promote a more sustainable energy system, through a more intelligent use of energy.

The reduction in energy consumption was not only considered on a direct for, but also indirect. For instance, the Focus considered recycling, reusing and reduction of any material/object which could be recycled or be used more than just once.

On the other hand, the Focus considered the implementation of best technology available, which might be already in the market, but, for any reason has not yet been implemented in these areas.

General objective:

Bring together innovative initiatives and measures, related to energy production and consumption and creation a forum where innovative ideas are generated in order to foster a sustainable development in rural areas.

Specific objectives:

1. To have a better understanding of the current situation of final users (business, city halls, citizens, etc.) in rural areas, from the perspective of these entities working in these areas. We will analyze Strengths, Weaknesses, Opportunities and Threats.
2. To understand innovative measures related to energy efficiency, best practices, etc. likely to be implemented in rural areas.
3. Create a network among innovative business in energy field.
4. To give importance to all the initiatives coming from entrepreneurs and students.
5. Elaborate a summary, containing the technology and measures overview, to be discussed during the capacity building workshops.

Target groups:

Innovative enterprises on energy field, Entrepreneurs, Last year students of Engineering, Environmental Sciences, etc., Technical Institutes, BICs, preferably, from rural inland areas. We promoted an innovative way of thinking regarding energy and its application for the dynamization of rural areas, which are located in the inland, far away from the main industrialized and developed areas.

Laboratory of Creativeness for “Innovative Technologies and Best Practice Applicable to Rural Development in regards to Energy”**Date and place**

19th October 2011 in Valencia

Organizer and participants

Organizer: CEEI Valencia

Participants: Stakeholders in energy sector innovation

Description of activity and results

Experts in different technologies discussed the renewable energies that need to be widely introduced in rural areas, such as solar (photovoltaic and thermal), small wind turbines, geothermal and biomass. Furthermore, good practice that is of interest to rural areas in order to promote sustainable development was presented.

Experts in different technologies discussed the renewable energies that need to be widely introduced in rural areas, such as solar (photovoltaic and thermal), small wind turbines, geothermal and biomass. Furthermore, good practice that is of interest to rural areas in order to promote sustainable development was presented, e.g. a series of projects about renewable energy implementation in rural areas.



Laboratory of Creativeness for “Saving and Energy Efficiency in Rural Areas”

Date and place

16th November 2011 in Valencia

Organizer and participants

Organizer: CEEI Valencia

Participants: Enterprises, farms, country hotels, etc.

Description of activity and results

The session addressed rural-based organizations and businesses looking to differentiate their product or process, to reduce their energy bills and find out about innovative technologies.

Experts presented the main initiatives and the most innovative technologies in this field, with the aim of reducing the cost of energy bills for municipalities and businesses, as it is important in enabling sustainable development in rural Valencia. Experts analyzed the energy situation of rural municipalities in the region and explained in detail issues such as municipal audits, lighting, saving energy in construction. Successful projects in rural areas were presented, including several farms, which have significantly lower energy bills thanks to the implementation of various measures.

It is also important that the municipalities themselves are aware of the significant savings derived from an efficient management of their facilities.



Laboratory of Creativeness for “Dissemination and Awareness of End Users”

Date and place

1st December 2011 in Valencia

Organizer and participants

Organizer: CEEI Valencia.

Participants: Users based in rural areas including local development agents, councilors, technicians and managers of municipalities, consumer associations, housewife associations, managers of rural hotels, etc.

Description of activity and results

With the aim of encouraging responsible consumption and the efficient and sustainable development of Valencian rural areas, the laboratory promoted activities that save energy, cut costs, and discussed recycling and re-using. Several measures were presented in regards to lighting, heating, appliances, waste management, water consumption and transport. Furthermore, several regional initiatives were presented in terms of simple steps that can be taken at home that result in significant savings in energy and water and, therefore, cost. A Valencia Energy Agency representative explained how to study household electricity and gas consumption and how to save by optimizing our energy bill. To achieve a multiplier effect and reach the largest number of end users possible, it was important to include local development agents and associations, which may spread the word among their neighbors and associates.



Laboratory of Creativeness for “Trends and Opportunities for Savings and Efficiency in Rural Areas”

Organizer and participants

Organizer: CEEI Valencia.

Participants: Valencian Energy Agency (AVEN), Renewable Energy Expertise, Requena City Council and users based in rural areas including local development agents, councilors, technicians and managers of municipalities, consumer associations and housewife associations.

Description of activity and results

The session started with a welcome by Jesus Casanova, General Director of BIC Valencia.

The seminar on 'Trends and Opportunities' was presented by Isidro Campo, from the Technical and Technological Innovation Project at BIC Valencia, who explained the different tools for detecting new trends in the environment and new types of consumers born of on-going social changes.

After the coffee break, the Valencian Energy Agency's Fernando Prats, from Technical Efficiency Savings and Public Service, told attendees about the energy situation in rural municipalities of Valencia. The attendees then heard several cases studies from rural environments.

Augustine Guillamón, Independent Consultant, gave practical advice in regards to biomass and solar thermal installations at home, and talked about how to decide on the most efficient system for a house.

Then, Bernat Chuliá Peris, from San Ramon Group explained the operation of their 100% sustainable Dairy Farm and re-use of waste generated by their biogas plant.

The last part of the session was devoted to the competition 'FUTURE-ANDO for efficiency and sustainability in Rural Area'; this contest was organized to motivate rural society in generating sustainable business ideas. After 16 ideas were presented, five finalists were chosen. The jury, made up of the speakers and experts from Requena City Council, awarded as follows:



- First prize - Juan Jesús Gil Gargallo - Reforestation with native species in extreme environments with ceramic protection.
- Second prize - Jose Vicente Garcia Herrai – PLADESOL.
- Third prize - Ana Belen Estevez – ENVIRONMENT Project.
- Fourth prize - Ignacio Ilzarbe, Abba Gaia Company - Nicotiana glauca as an energy crop in the fight against climate change, erosion and abandonment of disused farm.
- Fifth prize - Juan Alvarado - Comprehensive plan for efficiency and energy savings in the wine industry.

The first prize was awarded by Javier Berasaluce, Requena's Mayor, when he closed the session. Attendees enjoyed cocktail networking with other attendees and speakers.

Laboratory of Creativeness for “Programmes, Grants and Subsidies for Energy for Rural Areas”

Date and place

11th July 2012 in Paterna, Valencia

Organizer and participants

Organizer: CEEI Valencia.

Participants: Valencian Energy Agency (AVEN), Valencian Cluster of Energy Industries (AVAESEN), several Energy Companies, municipalities, etc.

Description of activity and results

The session started with a welcome by Jesus Casanova, General Director of BIC Valencia, who told the audience about the CEEI Valencia's activities in the context of the KnowInG Project.

Then Fernando Prats, Efficiency Savings and Public Service Technician of Valencian Energy Agency, told attendees about the energy situation in rural municipalities of Valencia.

After the coffee break, Bianca Dragomir from AVAESEN talked about the different European programmes for businesses and energy. This was followed by Eugenia Garcia, who explained the different national and regional programmes and grants promoted by AVEN and IDAE.

In the last part of the session several enterprises offered practical advice on the advantages and the procedures of requesting a programme or grant.



NAME OF TOOL

Helpdesks for SMEs and Public Bodies Transnational Cooperation

Taking place throughout the KnowInG Project, this Pilot Project aimed to give joint support to all SMEs and public bodies in the KnowInG Project's MED regions that wish to participate in innovative proposals on international and EU calls in the field of innovation, technology, culture and higher education. Established in most regions, the Helpdesk provided assistance and incentives for proposal preparation. An expert in each region was responsible for the Helpdesk and disseminating information to SMEs. With a broad range of expertise and thematic focuses across the regions, the KnowInG partners were able to refer SMEs to a whole host of tailored advice sourced from across the territories.

The Helpdesk of Valencian Federation of Municipalities and Provinces for supporting Public Bodies

CATEGORY SERVICE: Helpdesk

AIMS AND GOALS

In the framework of KnowInG project, Knowledge intelligence and Innovation for a sustainable Growth, the Valencian Federation of Municipalities and Provinces has created a Helpdesk for transnational cooperation.

The Valencian Federation of Municipalities and Provinces (FVMP) is a non-profit association with its own legal personality, composed of 539 City Councils, 25 Municipal Associations, 6 Minor Local Entities and the County Councils of Valencia, Castellón and Alicante. FVMP has as main goals: the representation, defence and promotion of Local Entities interests in front of Politic, Legal and Administrative Authorities; the development and consolidation of European spirit in local scope, based on autonomy and solidarity among Local Entities; the cooperation and technical assistance to the development of local interests; the promotion, execution and give of public and/or private enterprise initiatives and activities that contribute to economic local development and to employment creation.

Taking into account the objectives above mentioned, the target group of the services offered by FVMP are the local public bodies, so the Helpdesk was created to support public entities, mainly Local Entities, interested in taking part with innovative proposals on International and European Union calls on the field of Innovation and Knowledge Economy.

The Helpdesk service is developed through the website of FVMP, including:

- Information about the open calls for proposals in European and International programmes.
- Projects form, where the local entities can embody their ideas about transnational projects, to look for financial support in the framework of International and European programmes.
- Partners' search, to give information about organizations, from Spain and other countries, interested to present proposals in EU and International calls and searching

partners for transnational cooperation.

- News about European projects in which FVMP participates and the activities developed in the framework of these projects.
- Contact email.

The Helpdesk was created in December 2012 in the framework of KnowInG project. Although this project is finished, the Helpdesk is a service that FVMP continues offering for giving support to public bodies through their European Programmes Department.

ORGANISER AND USERS

Organiser: FVMP

Participants: Public bodies (mainly local organisations) interested in taking part in European and international programmes related to innovation and knowledge economy.

TOOL'S IMPACTS

This tool can improve and facilitate local governments in their participation of projects at European level.

WEBSITE

www.fvmp.es

Helpdesk For Entrepreneurs and Enterprises

CATEGORY SERVICE: Helpdesk

AIMS AND GOALS

CEEI Valencia is a local agent in the KnowInG network and offers an information and advice service, supported by agents and supervisors, so any entrepreneur or company with an innovative project may request expert advice on public funding schemes that best suits their needs, from local to European programmes and for all areas of innovation.

ORGANISER AND USERS

Organiser: CEEI Valencia.

Participants: Enterprises and entrepreneurs whose business activity is based on our focus in the KnowInG Project, and innovative initiatives for the sustainable development of rural areas based on an intelligent use of energy.

TOOL'S IMPACTS

CEEI Valencia advised 12 entrepreneurs and enterprises about different kinds of programmes and grants, most of them at local or national level. A summary table was also created including the most important programmes and grants at national and regional level.

WEBSITE

3.3.4 Conclusion: observations of innovation tools and their delivery through the KnowInG Project

The tools mentioned in this report give light to a range of key observations. In researching existing tools and creating their own, KnowInG Project partners discovered the benefits of the various tools in each territory at local, regional and national levels.

The experiences of the KnowInG Project at local level has shown that creativity and innovation maintain their vitality when expressed by different actors through actions promoting policies and providing tools that enable the development of creativity and innovation in very different regions in the Mediterranean and UK. This emerges by the experiences carried out also for the tools implementation in the project, as each initiative, even in the strong economic crisis of these years, has attracted actors and policy makers. Laboratories and events produced some employment, while all tools allowing to do network, to provide and use services and resources are attractive (as can be seen by the number of subjects involved in). In the next years these tools can be monitored beyond of the KnowInG project, for evaluating their ability to live independently and their usefulness in stimulating new and sustainable models for innovation and creativity.

The concept of tools for innovation was introduced as sets of services and actions that policies and actors make available. One of the results of the project is that the partners were able to create new classifications for tools that did not exist before. These classifications were developed so they can be used at local, regional and transnational level. In turn, this supports policy makers and actors in creating and delivering tools in the future. In fact, the use of the different identified kinds of tools can be used at the different levels, from local to transnational, and in particular, transnational level. That is, laboratories, workshops, seminars are very useful at local level. Helpdesks can support actions from local to regional to transnational levels.

Furthermore, the project partners found that essential creative and innovative processes start differently in different local communities. From individuals to companies, new ideas emerge in daily work in both structured and unstructured ways. This applies to all industries including the partners' focus areas of tourism, culture, crafts, ceramics, fashion, jewelry, etc. This considerable range of the different routes to new innovation requires an appropriate diversity of tools (as well as actors and policies) to support the process. KnowInG's new classification system can incorporate all of those required tools and any future tools that may emerge. Capitalization seminars, capacity building workshops and laboratories are some of tools that actors involved in the KnowInG Project have provided at regional level.

The tools' strengths and weaknesses were identified from questionnaire feedback and they have been integrated into project documents connected with these tools, such as the minutes of KnowInG Project events and meetings.

Partners and actors involved in the project have demonstrated that workshops, laboratories, capacity building initiatives and other local events can directly involve companies, institutions, organizations and individuals. Their direct involvement is important because it

creates a collective awareness of problems emerging at local level and supports problem-solving. Also, it reinforces local communities and projects them from local to transnational level. Face-to-face contact, the exchange of ideas and the building of new knowledge through the use of the project's tools proved to be very effective; they enable formal and informal communication among stakeholders. In fact, even in the case of stand-alone events, they acted as catalysts for stimulating the activation of local networks between companies, institutions and other actors of innovation.

For example, the Saving and Energy Efficiency in Rural Areas (Valencia, Spain) encouraged a network of enterprises, farms, country hotels and other participants, who learned about reducing energy bills and innovative energy technologies. These participants had the opportunity to meet experts in this field – an opportunity that may not have otherwise been able to happen. A weakness in using capitalization seminars, capacity building workshops, etc, is the cost of implementing them, particularly during times of economic crisis. However, the physical involvement of people, the organization activities and the use of structures is proportional to the number of people involved. This challenge, however, could be overcome with increased future exploitation of accessible online tools. The experiences of the KnowInG Project have also led to the conclusion that tools can be used in an effective manner if integrated with other tools. In fact, tools used at local level were intertwined with the transnational-level tools, and real tools amplify their effectiveness in combination with virtual tools.

These virtual tools enable actors to reach a very large number of people and to create or enlarge local networks at a very low cost. In addition, the use of social networks and online tools is generally less expensive in respect to the number of people involved; however, virtual relationships hinder processes that develop trust. For this reason social networks and online tools are more effective when used jointly with real tools. Trust can be improved aggregating online information and services from certified institutional sources.

According to some actors implementing online tools during the KnowInG Project informal communication in the delivery of services, information and knowledge (not linked to certified sources) play an important role in building networks and communities that stimulate a maturation, collective awareness and knowledge of the specific focus areas (i.e. renewable energy).

Also, the KnowInG experience confirms that access to financing, finding business partners, potential suppliers and potential customers, and the knowledge of local and transnational policies that encourage territorial development, are all relevant factors for innovation beyond the focus areas. This meets the KnowInG Project's objective of identifying dynamic tools that enable the building and evolution of networks.

The KnowInG Project developed and tested existing and new tools used in the different regions and/ or at European level to create, collect and make available services, information, methodologies and other general resources to express creativity and innovation during and beyond the project.

NOTES

1. CEEI VALENCIA
2. FVMP

3.4 Supporting internationalization of existing firms and promoting the attractiveness of existing areas through Helpdesks and Networking

Eurídice CRISTO^[1]

3.4.1 Introduction

The growing process of economic globalization places the discussion about the importance of internationalization of an economy as a crucial parameter for sustainable economic growth. Internationalization involves two main options: (i) serving of the foreign market through exports and (ii) attracting direct investments from abroad. Both options are considered important, especially due to domestic market stagnation of the MED area regions. Experiences from other countries reveal the different routes that internationalization took place. In the case of Asian Tigers, a partnership between government authorities and the private sector was established that helped the exporting orientation of the latter. With small domestic markets, these countries had to bet on strategies benefitting exports right from the beginning if they wanted their companies to become viable in the international milieu. In the case of China, the attraction of foreign investments was in the core of public policies, for many decades, mainly by establishing special economic zones for attracting foreign investment. From a point onwards supporting internationalization of domestic firms became an objective, too. In other countries, such as in India, the private sector became the steam engine for exports' promotion, through the exploitation of market niches and the full development of its comparative advantages.

Aforementioned paradigms reveal that export orientation and internationalization of firms, apart from being essential for their sustainable economic growth, needs also to be supported, though the kind and extend of support varies. Furthermore, aforementioned trends reveal an important market niche for European countries and MED regions in particular. Although at first the majority of transnational companies worldwide were originated from Europe, the United States and Japan, a significant change has been observed in the past three decades. In fact, there has been a significant increase in the number of companies from emerging economies in the list of exporters of capital many of which are investigating the EU as a potential place to establish their new facilities. Internationalization is an important growth driver, for countries with higher growth rates. It also allows risk diversification by disseminating business volume by new markets, creating a greater balance between economic cycles.

In this context eco-innovative industrial and enterprise zones have an advantage in promoting the internationalization and hence, economic growth of their area. Not only they have business lines with great potential and some of the most innovative firms, but they also offer a significant advantage for the investors that seek to increase business competitiveness, though reduced production costs, product identity and better marketing. In the context of KnowInG project a 'Helpdesk' was created in order to assist interested entrepreneurs and SMEs to internationalize their activities.

3.4.2 The Helpdesk of the University of Algarve for supporting enterprises

3.4.2.1 Introduction

The CRIA 'Helpdesk' was a service included in the framework of the Activitiy "Common Strategies for attracting and creating Innovation" of the KnowInG project, and was active from January, 2012 to May, 2013. The aim was to support SME's Internationalization and European Cooperation in Knowledge based related areas: Innovation, Technologies, Cultural and High Education, with focus on Tourism and CCI.

The "helpdesk" was promoted widely in official website of the University of Algarve and CRIA and in Facebook. It was also disseminated in a Capitalization Seminar (March, the 16), in radio broadcasts and through a leaflet distributed in several events.

3.4.2.2 The process

The interested entrepreneurs and SME's contacted CRIA through personal contact, telephone, or email. Then an exploratory meeting was arranged between them and an expert from CRIA. Afterwards, according to the needs, the entrepreneur/SME, was conducted to the entrepreneur was forwarded to the appropriate expert or service. Of course not all initial contacts were followed up because in most of the time entrepreneurs decide not to proceed with the business project.

3.4.2.3 The results

The ALGARVE HELPDESK of CRIA – UALG gave support to 59 entrepreneurs and SME's. From these, 32 were of Tourism, 13 related to ICT, 5 of Image, Design and Video, 4 of Arts and Heritage, 2 of scientific texts' revision and translations, 1 restaurant, 1 related to Environment and 1 dedicated to Events'Organization. Requests for internationalization came from 2 enterprises.

NOTES

1. Universidade do Algarve

3.5 Supporting sustainable development of Business Parks through complementary actions of local actors: The case of Provence Alpes Côte d'Azur

3.5.1 Introduction

The Provence-Alpes-Côte d'Azur (PACA) region in southeastern France is home to 237 business parks, which cover thousands of hectares. In 2005 a study carried out by the PACA Region Chamber of Commerce and Industry (CCI) on business parks in the PACA region, revealed that business parks were losing attractiveness. Following that study the PACA Regional Council is seeking to improve the quality of PACA's business parks through the provision of support to local communities.

In 2009 a regional network for "Sustainable development and business parks" entitled **ZADD network** was established by the Regional Agency for the Environment and Eco-development of Provence-Alpes-Côte d'Azur (ARPE PACA). The network also drew support from La Région

PACA along with l'ADEME Provence-Alpes-Côte d'Azur and the Rhône Méditerranée & Corsica Water Agency. It has to be noted that the Regional Agency for the Environment and Eco-development is a public body, the first of its kind to be created in France, which supports authorities in their sustainable development projects. The ARPE intervenes alongside regional and departmental bodies by developing and promoting innovative practices throughout the region in the areas of sanitation, aquatic environments, biodiversity, natural and green spaces, sustainable territorial projects (Agenda 21), responsible purchasing, waste sorting centers, environment-related jobs and careers, and, for the past 5 years, business parks.

Moreover, in the department of VAR, Associations of business leaders have been formed to help change the overall management of business parks and to build up a dialogue with the authorities concerned with the promotion of a more sustainable mode of business parks' development. Their formation was followed up by the Var General Council that set up a system of environmental quality labels to improve existing parks as well as new projects. The Var department provides economic support on condition that the park commits itself either to an Environmental Approach to Urban Planning (for extensions and new projects) or to the setting up of an Environmental Management System (for existing parks). Within this context, the Chamber of Commerce and Industry of Var (Var CCI) has created a campaign under the title **D²PARC** to improve the economic, social and environmental performance of the Var Business Parks.

It needs to be mentioned that the PACA region also signed an agreement with the National PALME association which has been working for the past 30 years to improve the quality of business parks by organizing networking events involving business parks in the Nord-Pas-de-Calais region. The main aim has been to bring actors together and to provide technical and organizational support.

The following paragraphs describe aforementioned projects, both pioneering in the support of sustainable development of Business Parks at local level.

3.5.2 The ZADD regional network and framework for "Sustainable development and business parks"

Aurélie RUFFINATTI^[1]

3.5.2.1 The ZADD regional network

The Regional Agency for the Environment and Eco-development of Provence-Alpes-Côte d'Azur (ARPE PACA) has been coordinating a network based on business parks and sustainable development in the Provence-Alpes-Côte d'Azur region since 2009 (See ZADD network presentation).

This network brings together partners in economic development, territorial development, and the environment, with each partner having a different vision of a sustainable business park.

Objectives and actions of ZADD network

Subscription to ZADD network is open to any business park developer, manager or leader, free of charge. The objective of the network is to promote the principle of sustainability in the development, redevelopment and management of business parks, through:

- sharing of good practices
- capitalisation and promotion of innovation within and outside the region
- co-development of tools and the sharing of resources
- support for stakeholders

Members of the network benefit from:

- Individual support if needed:
 - on the global and cross-sector approach of a project, (PALME approach), environmental management systems, sustainability charters and so on
 - on practices organised by theme, such as collective waste management, alternative water management techniques, and business services
- Information days on themes identified by members: waste management, rain water and waste water management, transport, services, energy and so on.
- A regional level discussion day on regional and national trends in strategies of development and the management of business parks.
- The co-development of a regional frame of reference on the development and sustainable management of business parks.
- Corporate Social Responsibility Trophies for business parks
- Monthly newsletter describing new tools and actions by members
- Provision of on-line tools and resources on www.territoires-durables-paca.org > Zones d'activités durables
- Database of good practices on a regional level: www.arpe-paca.org > Réseau régional ZADD

How the network operates

ARPE relies on a monitoring committee to pilot the mission and to ensure the collective strategic work such as identifying a common regional definition of a business park. ARPE also provides an arena for discussion and the exchange of information between institutional partners.

Committee members

Committee members of the network are the following:

- Financial partners: ADEME, Région PACA, Water agency, Départements des Alpes de Haute-Provence, des Hautes-Alpes, des Bouches du Rhône, du Var et de Vaucluse.
- Technical Partners: Regional Chambre of Commerce and Industry, PACA Chambers of Commerce and Industry, PACA Chambers of Trade and crafts and the national PALME association.

Key figures

The network has more than 330 members, representing 185 organisations:

- 40% local authorities (Metropolis, urban communities, communities of communes, communes)
- 27% institutional partners (ADEME, Water agency, Region, Départements, consular chambers)
- 13% business associations
- 13% planning and economic development agencies (urban planning agency, CAUE, Economic development agency...)
- 9% other organisations (businesses, environmental groups)

3.5.2.2 The regional framework for “The sustainable development and management of a business park”

In 2011 the ARPE defined seven aims for establishing a shared vision and common definition for the concept of a “sustainable business park”. Those aims have been:

Territorial component	Aim 1: Commit to a coherent, territory-wide political strategy of economic development.
	Aim 2: Manage land resources efficiently, optimizing development according to the needs.
	Aim 3: Integrate the park into the existing environment
Environmental component	Aim 4: Ensure good accessibility of the park and develop an efficient multimodal transport system for people and goods
	Aim 5: Conserve resources and minimize impact by implementing sustainable environmental management
Societal component	Aim 6: Promote the well-being of park users by providing shared services
	Aim 7: Strengthen the links between park stakeholders and inter-entreprise synergy

Following this, the partners of the ZADD network decided, in 2013, to continue their joint work by co-constructing a framework for the sustainable development and management of business parks in Provence-Alpes-Côte d'Azur, in order to break down the 7 aims of sustainable business parks into operational objectives.

Why a framework of reference?

The framework has been developed in order to help communities and their partners to answer the question of "What is a sustainable business park?". The aim is to inspire players to rethink local economic development and the development and management of business parks in order to promote not only the development of local businesses and the quality of business areas, but also the living environment and natural resources.

For whom?

This document is intended for elected community officials, developers, business associations and any other actor involved in economic development strategies and the development and management of business parks.

How was it drawn up?

This document stems from the work of the regional "business parks and sustainable development" network hosted by ARPE since 2009 with the support of the Region, ADEME, the Water Agency, French Départements, Chambers of Commerce and Industry (CCI), Chambers of Trade and Crafts (CMA), the National PALME Association.

It is the result of collaborative work between members of the network's monitoring committee and associated partners:

- Institutional bodies: Région PACA, the Water Agency, ADEME, Département des Alpes-de Haute Provence, Département des Hautes-Alpes, Département des Bouches-du-Rhône, Département du Var and Département de Vaucluse
- State bodies: DREAL PACA and DDT de Vaucluse
- Consular Chambers: Regional CCI, CCI des Alpes de Haute-Provence, CCI des Hautes-Alpes, CCI Marseille Provence, CCI Nice Côte d'Azur, CCI du Pays d'Arles, CCI du Var, CCI de Vaucluse, Regional CMA, CMA des Alpes-Maritimes and CMA des Bouches-du-Rhône
- Planning Agencies: AGAM, AUDAT, AURAV
- CAUE des Bouches du Rhône
- PACA Public Land Institution (EPF)
- Regional Economic Development Mission (MDER)
- Alpilles National Regional Park
- Business park developers: Syndicat Mixte du Technopole de l'Environnement Arbois-Méditerranée and Groupement Barjane

What does the framework consist of?

This document of about 80 pages is divided into 2 parts:

Part I: Pre-planning and sustainable management of parks

Before the phase of development or redevelopment of a business park, a number of questions concerning the relationship between economic and territorial development must be taken

into consideration. Strategic choices must be made at this level. This part identifies the strategic issues and possible solutions.

Part II: The operational implementation of the 7 aims for the sustainable development and management of a business park.

This part, which is divided into 3 components, breaks down the 7 aims for the sustainable development and management of a business park into operational objectives. These include:

- proposals for action,
- experience feedback,
- avenues to explore,
- closer examination of certain concepts
- tools.

3.5.3 D²PARC: A pilot project for sustainable development of parcs and activities

Anne-Laure CAUET^[2]

This initiative, the first in France, aims to:

- Increase the attractiveness of Var Business parks and enable them to obtain a quality label according to the criteria of the Var General Council;
- Reduce the environmental impact of the parks;
- Raise businesses' awareness of sustainable development;
- Facilitate businesses' daily operations;
- Develop joint services;
- Create synergy between businesses and local stakeholders.

By the initiation of this 3-year project, a leader was recruited and a call for tender was launched to select the firm of consultants which would work with the Business Parks Associations to set up the process.

The project itself involves four phases:

1. Diagnosis carried out by the Var CCI: Constitution and coordination of a Steering Committee (COPIL) and the project team, an economic, social and environmental analysis of the business park, and the launch of surveys of the park's businesses.
2. Corporate Social Responsibility (CSR) self-evaluation: Identification and promotion of businesses' CSR practices, supported by a programme of events.
3. Drafting of an action plan based on the findings of the diagnosis, the CSR self-evaluation and consultation with stakeholders validated by all partners and formalized by the signing of the Charter
4. Monitoring of Actions.

And in parallel:

- Setting up an Environmental Management System (EMS), reaching level 1 of ISO 14001 Certification with support from a firm of consultants, and obtaining the EcoVar label from the Var General Council.
- Organization of inter-park workshops to encourage interaction among the parks' business associations and to provide information about topics of interest (security, communication, events, business alliances)

Following a call for tender in September 2011, five business parks in the Var were selected. Each park underwent an assessment, including a site visit to meet stakeholders and an on-line survey to identify the needs of more than 300 of the park's businesses.

At the business level, company leaders were asked to evaluate their CSR performance. This provided information about good practices from 170 businesses and helped raise their awareness of CRS. Information meetings were held to help businesses optimize their practices.

The five action plans, as well as the tools needed to obtain ISO 14001 level 1 were drawn up.

Since March 2014, the five business parks have obtained ISO 14001 level 1.

Six inter-park workshops have been held on topics such as ISO 14001, security and waste management on a business park.

Today, five business parks, representing more than 950 businesses are involved.

Main attributes that distinguish the project as a model

Multi-level governance and the involvement of other actors	Territorial impact	Portability/dissemination of methods	Contribution to European priorities
The financial partners of this operation are FEDER, ADEME and the Var General Council. Steering committees are composed at a minimum level of the Var CCI, the association of businesses and the inter-municipal manager. These entities take part in all the inter-park workshops. Certain	Image: attract motivated businesses, respond to a growing demand and create a positive image through international recognition of the ISO 14001 certification. Quality of life: Optimize the integration of the business park into its environment, develop an interaction between the territory and businesses and minimize disturbance for the neighborhood. Environment: Better control of nuisance factors (noise, odors, landscaping, effluent etc.)	The following tools may be transferred: - Frame of the diagnostic report; - On-line questionnaire «Businesses' vision of their business park» analysed using specialised software; - On-line CSR self-evaluation tool and analysis by specialised software; - Tools to monitor EMS / ISO 14001 certification, level 1; - Lists of topics and information sheets distributed during inter-park workshops; - Communication tools.	D²PARC was part of a sustainable development approach aimed at improving the environmental, social and economic performance of business parks. Following assessment, actions were defined according to community priorities. These actions include transport, collective waste management and information about recycling directed at business

stakeholders intervened according to the topics being presented (for example: inter-municipal associations on the topic of waste management) in meetings and in inter-park workshops. Communication tools sent to businesses were validated by all local partners and serve to inform technical and financial partners	minimize environmental impact and set up an Environmental Management System. Economy: Create conditions that will favor the sustainability of quality actions, lead to a collective management of the environment, facilitate the commercialization of the park and minimize maintenance costs.	leaders and employees, the setting up of new services for users, and water management. Other actions concerning risk management, energy, landscaping and park maintenance will be implemented.
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NOTES

1. Regional Agency for Environment of Provence Alpes Côte d'Azur (ARPE PACA)
2. Chamber of Commerce and Industry of Var (CCIV)

3.6 Smart, low cost ways to stimulate creativity

Marisa MADEIRA^[1]

3.6.1 Introduction

Nowadays, boosting creativity process in the business sector is considered essential both for solving many of the problems that arise in firms, as well as for marketing and promotion of new products or services, and strategies. One of the key aspects of any firm's success or failure is its ability to stay ahead of the competition in a rapidly changing environment. In that sense growth and survival can be related directly to the embeddedness of the creativity stimulation process to a firm, while this can be further implemented to any organization.

Eco-innovative industrial and enterprise zones have by definition the creativity dimension incorporated in their context; not only they intend to attract new and innovative firms, but they also need to elaborate eco-innovative solutions to tackle the problems of their operation and development. In the framework of financial constraints that MED programme area regions are facing it is essential to investigate new, smart, low cost ways for creativity capacity building of all entities (from individuals to managing bodies) involved in the development of eco-innovative industrial and enterprise zones concept.

Through the KnowInG Project – Knowledge Intelligence and Innovation for a sustainable Growth such methods have been investigated. The following paragraphs present in detail two of the tools that the University of Algarve used to address this issue that could easily be replicated elsewhere.

3.6.2 The Algarve Contest: Your creativity is our future!

The University of Algarve, through the Division of Entrepreneurship and Technology Transfer (CRIA) and the KnowInG Project – *Knowledge Intelligence and Innovation for a sustainable Growth* – promoted a Contest entitled *YOUR CREATIVITY IS OUR FUTURE*, which aimed to create a story for a videogame.

The KnowInG Project intended to promote the "knowledge economy" and enhance the cooperation and the encounter among the public institutions, the innovation organizations and the economic actors for the creation of new territorial development policies.

The contest was inserted on the activity 'Think Tank' of the KnowInG Project. The target was Individuals M/F, above 18 years old. The applicants had to be fluent in English.

The objectives

1. Promoting the creativity and innovation between the target adult populations, in order of addressing not only the students of the University of Algarve but also population in general.
2. Stimulating the creation of a storyline about the thematic 'Culture and Tourism' that could be possible to be developed and/or presented on a videogame, to divulge the Algarve region.
3. and encourage the participation of the Algarvian community on European Projects that University of Algarve is involved, with the aim of approaching the community on the activities.

The Award

The award consisted on a travel to Lavrion, Greece, to participate on the KnowInG Fair, held in 25th to 27th of October 2012., including:

- Travel expenses, accommodation and free entry in the KnowInG Fair.
- Participation on the workshops and visit to the Lavrion Technological and Cultural Park.

The Jury consisted on 5 Experts related with Arts and Culture sectors.

The process

Besides the formal requirements of the proposal (maximum two pages A4, Letter size 12, Double space) the storyboards were evaluated according to include the following criteria

- *Storyline (argument);*
- Main characters (brief characterization of physical and psychological);
- Relation between characters (e.g.: friendship, loving relationship, professional, strangers, etc.);

- Scenario where the actions happen (e.g.: city, beach, village, etc.);
- Temporality (e.g.: year, month, etc.).

The contest was launched at 16th of March 2012, in the KnowInG Capitalization Seminar, in Faro. The applications were received until the end of May 2012 and the winner was communicated on 31st July 2012.

The results

There were received 10 applications.

The winner was Nuno Rodrigues who presented a storyboard linking Geography, Culture and Heritage of Algarve. The argument consisted on an Arab prince Ibn Qasî, living in the Algarve, of century XII, who will go through several stages (five levels of the videogame) and overcome many trials in order to forward a testimony for centuries. Through a set of mission, adventure and confrontation, key sites in the Algarve region are traversed, either natural spaces or humanized.

As winner Nuno Rodrigues travel to Lavrion, Greece, on 26th and 27th October 2012, who presented his argument and attended workshops and seminars and participated in a Game Jam.

3.6.3 Creativity Labs, the methodology

Introduction

The methodology of the Creativity Labs developed on KnowInG project consists on a roadmap to conduct and animate a session aimed to stimulate creativity of individuals and help to structure the ideas that arise, in a business perspective. It is a tool for trainers, educators, teachers, business supporters, local development agents hereby understand as facilitators, to enable them to conduct and animate a session.

The guiding methodological principle in which this roadmap is based is the Experiential Learning Theory (ELT) of David Kolb

Kolb explain individual's learning through a cycle of 4 stages - the 'cycle of learning' - in which **'immediate or concrete experiences'** provide a basis for **'observations and reflections'**. These 'observations and reflections' are assimilated and distilled into **'abstract concepts'** producing new implications for action which can be **'actively tested'** in turn creating new experiences.

The guiding methodological principle

The roadmap itself is based in principles of ELT because it starts from the participant and returns to him. It considers that each individual has already some knowledge and experiences, which lead them to observe and reflect in a specific way. When they perform an activity in group, they are encouraged to reach new solutions for the problems. The debate and the sharing of their reflections are stimulated. They are 'pushed' to learn the most as possible

with each other's. To stimulate this debate it is recommended, as group dynamics, an exercise based on problem situations or challenges and the participants are encouraged to apply their knowledge in simple situations in an effective way, which reveal, and also develop, their entrepreneurial spirit.

Along with the methodological principle explained above the session contemplates some techniques to stimulate creativity and to help to structure ideas in business terms.

It combines, in separate phases, the divergent process of coming up with ideas (Ideas Generation) and the convergent process of reducing all the many ideas into realistic solutions (Ideas Selection).

The duration of the session is about 2,30 hours - 3 hours, it depend on the number of the participants (6 - 20).

The process - Session Plan

- Introductory Ice-breaker "What am I through plasticine?"

Each participant receives one piece of plasticine. He/she has 2 minutes to build an object with the plasticine with which he/she feels identified and introduces himself/herself through this object. Through the sculpted objects in plasticine all the participants introduce themselves, one by one. **10 min.**

- Exercise "image cards"

The image cards act as 'talking pictures' and each participant has to associate the images and think of new business ideas (Individual Brainstorming). **10 min.**

- Group dynamic "Exploring ideas, thinking in businesses"

The participants join into 3-5 groups. Each group choose one of the 'business idea' presented by one of the elements or combine two or more ideas in a new one. The group explores the business idea and presents it in an A2 cardstock that will be posted on the wall. **90 min.**

- Debriefing (plenary)

Talking about the creativity exercises: the participants discuss in plenary the exercises. Achievements, what resulted well / what did not result, timings, parallelism with reality. Talking about the role of the facilitator. **20 min.**

- Evaluation and Conclusions.
- Written questionnaire and/or Oral assessment (method '5 fingers') **20 min.**

The results - KnowInG Creativity Lab in the Algarve

The Creativity Lab was held in Faro, on 29 June 2011, in the framework of KnowInG Project. There were 18 participants among entrepreneurs, SME managers and University Students.

From the Lab resulted 5 businesses ideas:” K2” (Promotional campaign of regional products); “Doi Doi Toy” (Pediatric Diagnostic Devices, fun and ergonomic); “Pensa Rápido” (plasters for children and youth); “Uflip” (vending machine with multitouch technology 3D, to produce, on time, personalized slippers); and “Travel to the Senses” (an event of virtual reality to promote the region).

These ‘businesses ideas’ resulted from the group exercises explained above. This was an educational exercise, with no intention of giving birth to new businesses; just to give participants the opportunity to experience a creative process and think about the needs they would have if they wanted to move forward with the business and start-up a company.

The presence of experts in the fields of business plans, marketing, Finance and IP rights also served to highlight relevant aspects that should be taken into account when creating a company.

Notes

1. Universidade do Algarve

3.7 Territorial Observatory on Sustainability in San Marino: a profitable governance tool

Luigi BRUZZI^[1], Emanuele GUIDI^[2], Simona VERITA^[3], Valeria STACCHINI^[4]

What is a Territorial Observatory on Sustainability (TOS)

To improve the sustainability of a territory, its development has to be measured through specific indicators. The main function of a Territorial Observatory on Sustainability is to stimulate a positive social attitude towards sustainability by providing the best available information, facilitating the decision-making and stakeholders participation. It can provide various services, such as integrated monitoring of the sustainability of the development, supporting policy-making in prioritization and allocation of resources and community participation process, developing thereby capabilities and knowledge through the supply of information and ensuring appropriate dissemination of results based on scientific research.

This paper analyses the process applied to the Republic of San Marino, and it is based on the results of a study performed in the framework of collaboration between the University of Bologna and the “Coordinamento Agenda 21 San Marino”. The limited size of the territory concerned and the proper functioning of the statistical offices, constitute favourable conditions for the achievement of the goal. The proposed method, however, can be favourably transported and adapted for monitoring the quality of industrial areas system, and its external impacts on the communities and the environment.

For example, the actual situation in the city of Taranto (located in the southern part of Italy and where an important steel manufacturing plant has been operating since many years, supposed to have emitted unspecified quantities of pollutants) would not have reached the current dimension if environmental controls, now considered essential, would have been implemented in due course.

The control of all elements that contribute to worsen the quality of the environment and, consequently, the health of human beings, is currently recognized as essential to ensure the level of excellence of the environment in which we live. The control systems concerning the environmental quality and the level of sustainability require specific tools, able to evidence the trends in both, positive and particularly important, in negative sense (Moreno-Pires and Fidelis 2012) (Shieldsa et al. 2002).

The following brief remarks show how difficult it is to measure the level of quality of a territory and its evolution in time and space. The disciplines needed to measure the level of quality of a territory are numerous and they include, among others, expertise in statistics, economics, social sciences, political sciences, educational, physic, chemistry, environmental sciences, etc.

Sustainability indicators for a Territorial Observatory on Sustainability

Sustainability is a process that conducts towards goals that should get closer and closer to the requirements set by the principles of sustainable development stated in the Brundtland Commission's Report "Our Common Future" in the 1987. The concept of sustainability can be linked to a given human activity, or a local context, or even a product.

The identification processes of the indicators necessary to identify and measure sustainability are numerous and complex as well as the system that interconnects them. Only one or a limited number of indicators is usually insufficient to determine the level of sustainability. In fact, improving sustainability is a process that is effectively evaluated only if a combination of indicators and their interaction meets the requirements of measuring and monitoring sustainable development in all its complexity (Repettia and Desthieux 2006).

Sustainability indicators implemented through a TOS intend to offer information to local authorities which are committed to achieving a sustainable model of development, and fulfilling at the same time the purpose of providing evidence about their progress to support the prioritization and allocation of resources. They can be defined, established and monitored through the TOS, which is meant to be a practical tool to verify the evolution of the environmental situation and sustainability for a given territory. In this context, the indicators for local sustainability must go beyond the functions typically performed by environmental parameters, overcoming thereby the sectorial approach by taking also into account the economic and social aspects.

This is the reason why they are commonly defined "integrated indicators", which reflects the interplay between environmental, economic and social issues. One of the important functions performed by the TOS is continuous monitoring of indicators to capture and evaluate their change throughout time and space. In this manner, it is possible to identify trends and select intervention directions. The choice of indicators, relevant to characterize a given territory, constitutes, hence, the first objective of any proposed TOS (Márton 2012).

Suitable indicators for a TOS should be able to describe: working activities and employment data, physical characteristics of the territory, features of urban areas, types of mobility and logistics, production and use of energy, effects on climate, availability of water, quality of soil and subsoil, air quality, level of noise and radiation, waste management and recycling, presence of polluted sites, among the most important.

The classic monetary parameters are no more sufficient to measure the wealth of a country. It must be aware of the fact that the environmental quality is becoming more and more index and prerogative of the socio-economic development of a country. However the indicators of sustainability should also go beyond the traditional environmental indicators, They will have to overcome the sectoral approach to be characterized as “integrated indicators”, reflecting the interaction between environmental, economic and social aspects.

The study performed, permitted the selection of the reputed most meaningful indicators and to calculate some of them. The selected indicators were: Gross Domestic Product (GDP), the Human Development Index (HDI), energy, water, municipal waste and air quality indicators, alongside with the carbon and ecological footprint (Maxim 2012).

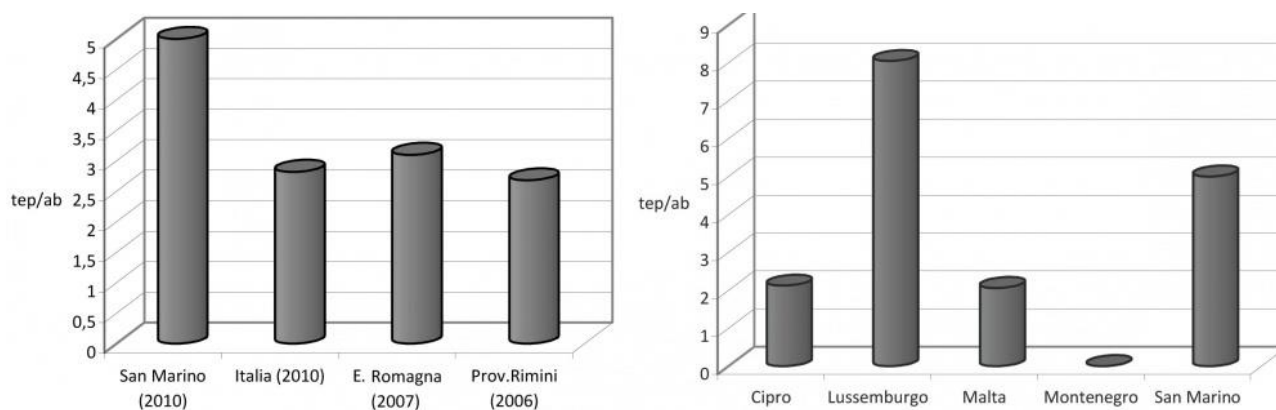


Fig.1 Comparison between the index of per capita energy consumption of San Marino and other small states, as well as among San Marino and the neighboring territories

Due to the limited resources available for the present study, it was not possible to address the calculation of the ecological footprint according to the classical methodology developed by Mathis Wackernagel and William Rees of the University of British Columbia. It was adopted an alternative approach which, although not guaranteeing the absolute validity of the results, has the advantage of raising awareness about the behavioral norms. We opted, hence, for a demoscropy survey, carried out by a questionnaire, comprising simple questions whose answers allowed to identify the lifestyle and, henceforth, the sustainability of individual behaviours. This is a methodology extensively used and which has already provided interesting results in many countries. The use of the demoscropy information coupled with considerable difficulties in obtaining large numbers of respondents, is, however, mainly due to the lack of sensitivity towards sustainability still present in broad portions of the population. The questionnaire selected for the calculation of the carbon and ecological footprint is the one proposed by the WWF (<http://www.improntawwf.it/main.php>). The opinion poll involved, unfortunately, only a few people: about fifty families from all over the territory of the Republic, for a total of about 160 individuals, provided appropriate answers on the basis of which the calculation was performed. The average value was 5 hectares per capita for the ecological footprint and 12 tons of CO₂ equivalent per year for the carbon

footprint. Considering the data of 5 hectares per capita and multiplying it by an average population of about 32,000 residents, we get that the territory which the Republic should have to meet the current needs, should be about 26 times higher than the effective extension.



Fig.2 The results of the opinion poll on ecological footprint of San Marino: in black the territory effectively available, in grey those San Marino needs to meet current lifestyles.

This data gives an idea of the scale of magnitude of the biocapacity deficit affecting the territory of San Marino compared to the current lifestyles of its population. For comparison, it should be considered that ecological footprint for Italy is 4,2 hectare/person and that the average bioproductivity of our planet is 1,78 hectares per capita.

The tourism dimension as first test field

Tourism has been identified as the first possible field of application for the following reasons. Tourism is nowadays one of the main sectors of the world economy. Tourism is important, and in some cases essential, to the economy of many countries, including Small States. As results of the general economic crisis started in 2008, the tourism sector has greatly slowed. Tourism effects on the environmental and social sustainability. In recent times the need of a sustainable tourism has emerged, providing sustainable management of resources in such a way that economic, social and aesthetic needs could be met while maintaining cultural integrity, essential ecological processes, biological diversity and ecosystems (UN World Tourism Organization, 2004)

The Charter for Sustainable Tourism resulted in Lanzarote in 1995, shows how the informed participation of all the involved stakeholders and the consent of the resident population are essential factors to initiate policies for a sustainable tourism, which could not be careful only to the satisfaction of guests, but also ensure the quality of life locally. Its pursuit is an ongoing process that involves constant monitoring of impacts and the introduction of preventive measures or remedial actions, if required.

The development of key indicators is an effective way to focus attention on key issues, obtain information on the current situation, define objectives and identify actions to improve.

In the case of San Marino, for the development of sustainability indicators related to tourism, has been adopted the methodology proposed by UN World Tourism Organization in the Guide on Indicators of Sustainable Development for Tourism Destinations (2004). It is a participatory method that produces advantages for both the destination and participants. The steps that make up the process of indicators development are 3: research and organization; definition and development of indicators; implementation. In consideration of the scarcity of resources and time, the study mentioned above developed only the first of these 3 steps. The focus on this first step is very important also because it is useful to respond to Unesco guidelines for the implementation of management plans.

In 2008 the Unesco Committee has in fact approved the inclusion of the historical center of San Marino and Mount Titano in the list of Unesco World Heritage.

Unesco management plans involve an in-dept knowledge of the site, shared by all stakeholders, the involvement of all parties responsible for the site and stakeholders, building and training of human resources and expertises for the development of the site.

This crucial first step consists in gathering basic information regarding the tourist destination, tourism industry, stakeholders, past and current problems to face, studies that can be used to support the future development process for developing a specific indicators package. For this purpose the peculiarities of San Marino have been investigated: the geological and landscape heritage, the urban development and mobility system; the image of San Marino as City-State, City-Postcard and City-Market; the time evolution of tourism and the actual tourism typologies; the current framework for tourism policy; the use of participatory processes. The research identifies major resources and risks related to tourism. The resources analyzed were classified into tangible, intangible, reproducible, and no-reproducible.

Tab. 1 The main tourism resources of San Marino

	Tangible	Tangible	Intangible
	Anthropogenic	Natural	
Reproducible	museums trading system conference centre sports facilities agriculture, food and wine philately and numismatics arts and crafts	cultural landscape theme parks and green spaces	pageants civil and religious ceremonies sporting events musical events cultural events
No-reproducible	monuments and historic buildings	Mount Titan cliff geological and natural formations	state identity democratic institutions liberty and

	archaeological sites old railroad	environment and landscape	independence historical legacy
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Among the problematic aspects that should be carefully monitored, the research highlighted - urban development, land use, and modification of the landscape; the absence of appropriate regulation, management and enhancement of natural areas; roads and parking; environmental pollution; the sustainability of tourist facilities. Concerning the need to respect the socio-cultural authenticity of host communities, preserving their cultural heritage and traditional values, the research highlighted the risks to change or cancel the identity characters, and to lose the authenticity of the collective memory, proposing only a fake "consumption of the past". Because sustainable tourism should pursue long-term economic operations, promoting socio-economic benefits equally distributed, some problematic aspects of the reality of San Marino consist in the concentration of flows in a small area, together with a stay somewhat reduced (3 hours on average) and the prevalence of car use. Tourism ways-and-run leads to significant negative environmental and social impacts, while it is not always the bearer of adequate economic benefits.

Conclusions

In any given state, even when goals have been agreed and set, policy-makers need to prioritize and allocate resources in the face of eventual conflicting requirements concerning economic growth and social progress in conjunction with environmental sustainability. Wrong decisions can have serious consequences, being the cause, e.g., of crises and even leading to an increase of human suffering. Improving the basis for sound decision-making, integrating many complex issues in comprehensible indexes, providing simple signals to the decisionmakers are thus of paramount importance. In the present time, when modern technologies increase the flow of information but not necessarily our ability to properly evaluate it, we need tools that condense information for rapid assimilation, rising thereby awareness.

This is the key role of a TOS, based on the adoption, measurement and monitoring of suitable indicators. In general it can be safely stated that there is always room for improvements in any given anthropic activity. The present preliminary assessment of important sustainability indicators towards the establishment of a TOS in the Republic of San Marino shows that some of them display potentialities for development. They also provided the basis for international comparisons in support of the pursuing of sustainability goals and targets.

San Marino can now design and implement a national programme for sustainability, based on data that go far beyond traditional economic and social statistics. This type of collecting and evaluation of data campaign can be adapted and customized to similar realities in comparable territories. Similarly the methodology, and the set of integrated indicators described, can be adapted and used to monitor specialized settlements, as industrial areas. In this context it has to be kept in mind that the priority is to increase the use of information for policy making, planning and management of resources in a sustainable manner. According to present international experience, defining indicators and using them to support decision-making has proven to be most cost-effective towards sustainable development, under the general principle that prevention is always better than cure.

The Observatory of Sustainability is also a useful tool for guiding the community toward a shared social responsibility, a horizon on which the major international organizations are working to address the challenges of the future: co-decision and co-design, conflict prevention and promotion of alliances, importance of reputation, promotion of trust and reciprocity networks, sharing of knowledge, inclusion of weak actors.

NOTES

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3.8 Green Urban Regeneration. La Foia Case Study, Valencia

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3.8.1. Introduction

For decades, urban planning, regional planning and landscape protection face a common challenge: the integration of rural and urban space. In this work, urban planning and the right design techniques and tools that develop actions to integrate those spaces, whether they are buildings on the edge of cities or in the countryside. Note that the effectiveness of the measures Management of Green Infrastructure in the Iberian Southeast (Valencia, Spain) taken is still insufficient for setting natural, rural and urban integrated space, proposed by the UNESCO Chair in Reserves Biosphere and Urban Environment. In this sense, the Territorial Agenda of the European Union 2020 (Territorial Agency of the European Union 2020: Towards an integrated, intelligent and sustainable society for a Europe of Diverse Regions of 18 May 2011, Hungary) aware of the challenges of climate change, biodiversity loss and vulnerability of landscapes, proposes the integrated development of urban and rural areas by improving accessibility and local capacity through the use and protection of natural values, ecological functions and services. Regarding the management and connection of ecological, scenic and cultural values of the regions, the integration of ecological systems and protected areas for their natural values in the networks of green infrastructure at all levels is encouraged.

Green Infrastructure is configured as an essential asset for sustainable development in spatial planning that places value on the environmental component of the urban planning process. In this paper the characteristics of the green infrastructure in the Valencia territorial strategy are analyzed. Moreover, it is a strategically planned and managed network of which depends the permanence and growth of a community as it is a conservation strategy for certain key areas for maintaining healthy ecological functioning. Thus, Benedict and McMahon (2002) defines green infrastructure as *"a network (system support wildlife) interconnected waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks and other conservation lands; working farms, ranches and forests; wilderness and other open spaces that support native species, maintain ecological processes, sustain air and water resources and contribute to the health and quality of life for communities and people of America"*.

Although the term "*green infrastructure*" appears in the nineties, the American concept has its roots in the eighteenth and nineteenth centuries, derived from two fundamental ideas: the idea that the parks green spaces together for the benefit of people and the idea of the preservation of natural areas for the benefit of people and the fight against habitat fragmentation (Firehock, 2010). Landscape architect F. Law Olmsted in his work on public parks, devised a system of parks from New York to San Francisco, where the parks are linked or around entire neighborhoods providing positive effects for individuals (e.g., with a focus on recreation, bicycle and pedestrian trails and improving public health). However, the term green infrastructure has been confusingly used in connection with the "green building" or building infrastructure (rain gardens) to manage the effects of flooding due to rainwater in the city with the increased use of vegetation (http://water.epa.gov/infrastructure/green_infrastructure/index.cfm). Then they have incorporated programs or multifunctional project spaces for reducing air pollution and improving urban biodiversity with economic, environmental and employment impact for the community in collaboration with local, private companies or individuals public agents (Taylor and Taylor, 2013).

At EU level, the EU Strategy on Biodiversity [COM (2011) 244 Final] 2011 points aimed at maintaining and enhancing ecosystems and ecosystem services in 2020 by establishing green infrastructure and restoring degraded ecosystems.

At European level, the Green Infrastructure is a multifunctional tool that provides ecological, economic and social services through natural solutions to individuals. This is defined in the Communication from the European Commission on Green Infrastructure: improving the natural capital of Europe [COM (2013) 249 Final] as "a network of natural areas and semi and other environmental elements, planned strategically designed and managed to provide a wide range of ecosystem services. It incorporates green space (or blue, in the case of aquatic ecosystems) and other physical elements of terrestrial spaces (including coastal areas) and marine. In Terrestrial areas, green infrastructure is present in both rural and urban environments".

This conservation strategy operates first at the landscape scale, and ideally fixed before development begins, then integrated locally, where green infrastructure approaches focuses on the city trees, habitats and streams, parks, trails, and more recently soil quality and soil restoration opportunities, for example in the vacant lots.

According to this view, green infrastructure is defined as a multi-functional tool that provides ecological, economic and social services to society by conserving one, essential for maintaining the functioning of natural resources interconnected network of spaces that enable life in the territory.

Moreover, the strategy of Valencia industrial policy, Vision 2020, the Generalitat Valenciana, Ministry of Economy, Industry, Tourism and Employment (2), in the Mission Point, instruments and strategic objectives, considers various lines of action. The line 3. Diversification: modernization and new sectors, is reorienting regional production structure. Encourage R & D and ICT as a driver of competitiveness. In line L3: Promoting a green industry: eco-industrialization says: "In the process of reorientation of the productive activity of Valencia, the green industry (eco-industry) has a relevant role in the generation of greater value added and employment in the industrial sector in this sense, the actions must be aimed in three directions: 1- The introduction of environmental improvements in the production

processes of existing businesses, 2- The start-up of new companies targeting this niche market and, 3- An energy policy based on efficiency and regional self-sufficiency:

A1.3.1. Promoting sustainability in existing sectors: maximize energy efficiency, reduce the need for raw materials and minimize waste generation.

A1.3.2. Incentives to new sectors linked to sustainability: home renovation, sustainable building, waste treatment and reuse, mobility, renewable energy, and biodiversity.

A1.3.3. Support to the use of renewable energy and building networks intelligent power distribution.

Prioritization of actions:

3.3.2. Encourage R & D and ICT as a driver of competitiveness In a period in which the industry is not only restrains the financial crisis we are experiencing but also strong competition from developed countries, new technologies are reaffirmed as essential engine of economic progress and competitiveness. The industry in Valencia is to be a cornerstone at this time to achieve recovery and a strategic long-term approach, for it is necessary to conduct more R & D as well as providing greater importance to ICT. The lines of measures to achieve this objective are:

L2. Promotion of "technological enclaves" in industrial parks

In order to obtain further technological development technological enclaves in industrial parks is encouraged not only the location but also encourages enterprises in these same. The aim is to support the creation and establishment of companies and institutions based on science and technology in the same site to provide collaboration between companies. This is to promote, disseminate and encourage innovation in companies that base their activities in the industry:

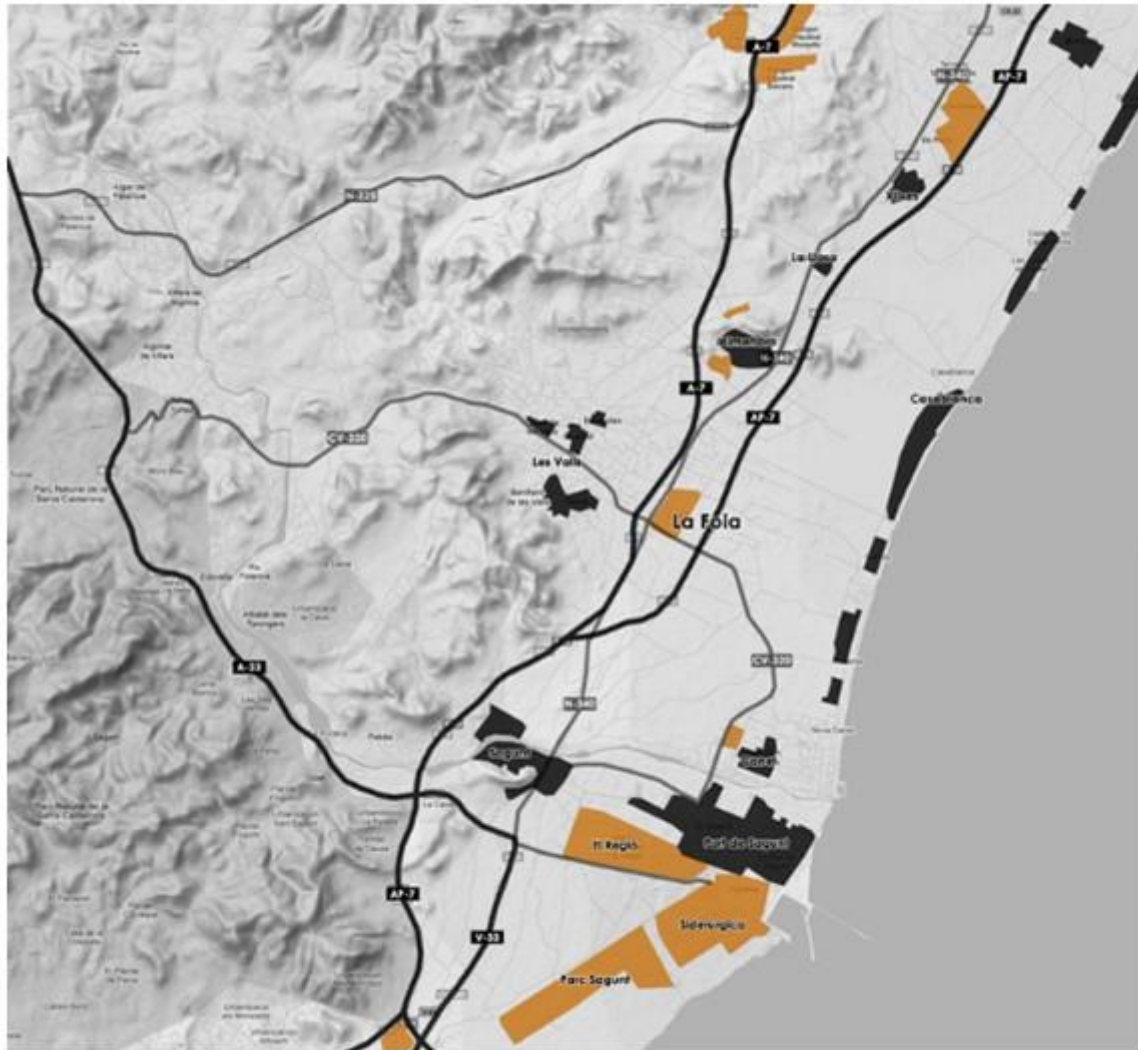
A2.2.1. Advanced technological infrastructure "technological enclaves"

A2.2.2. Incentives for technology companies locating in industrial parks

3.8.2. Discussion

Location

In this context the challenges of this report is to share the experience in the development of an academic project in a singular industrial enclave, "Poligono Industrial La Foia" located in The "Mancomunidad de Les Valls". A group of municipalities organized as commonwealth belonging to Valencia Region, Spain, specifically the province of Valencia, in the county of the "Camp de Morvedre", limiting to the northeast with the county of "La Plana Baja". This territorial area brings together the municipalities of Benavites, Benifairó de les Valls, Faura, Quart de les Valls and Quartell.



1. Encuadre regional

It is located in the north of the province of Valencia, between the towns of Sagunto and Almenara. Accessible from Valencia, throughout the A-7, then taking the N-340 and CV-320 eventually.

The Commonwealth of Les Valls was established over twenty years ago to better manage the waste collection and social services, mainly. Over the years it has grown considerably in the management of services in order to contribute, in their measure, to improve the quality of life for residents. Today manages the following services: ambulances, culture, sewage treatment, education, firefighting, street cleaning and garbage collection, slaughter, seniors, and urbanism. Its economy is based on agriculture with a clear predominance of citrus growing in the industry and supported handling and processing thereof.

Case Study

The “Poligono Industrial La Foia” is an existing industrial park compose by two main urban fabric: -Uncontrolled proliferation of business accommodation, around a structural road (49 ha); and a new development areas promoted by a single municipality, with a weak urban structure, any added value activities (73,23 ha)

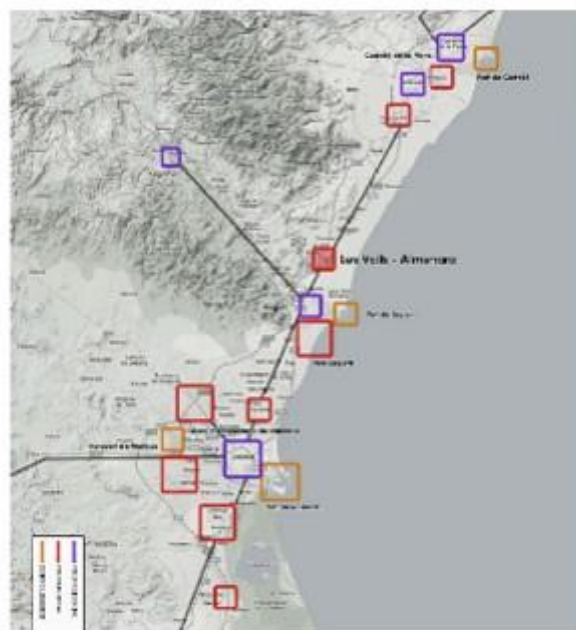


2. Existing Industrial park (red uncontrolled industry, orange new development)

The industry is now dispersed by the municipalities, with a weak service infrastructure and impoverishing the landscape of the urban edges. In other hand the level of consolidation in the urban fabric of the new industrial development is low, being less than 40% occupied land disposed. This allows us some flexibility in the management, with low impact on existing industries, and a margin for conventional companies that want to move from the urban edges of the municipalities of “Les Valls” to the new industrial enclave.

Regional position

If we make a zoom out, the place have a position of opportunity, located in the infrastructural Mediterranean corridor, with high territorial accessibility by highways and railways, just at 20' from Valencia and Castellón.



3. Regional industrial Structure.

At the scale of Valencia Region is important to highlight its relationship with the main pole of industrial activity. The metropolitan areas of Valencia and Castellón, consolidated at European level. Halfway between the two, we find Sagunto historically active and industrialized city. Today Sagunto aims to become the logistics and industrial center of the Mediterranean, with large-scale operations, such as “Parc Sagunt”, guarantee of this revival. Moreover, its port infrastructure is already worthy competitor in the Mediterranean, and there are voices calling to become extension of Port of Valencia, networking.

Given the economic power expected for the city of Sagunto, it should propose an R & D that draws on the activity and the needs of new businesses and services that will be located in this area.

After this introduction we can conclude that It's a wasted space for its location: It has a considerable number of available lots, any consideration with its particular environment and lack of services and added value facilities.

So at the scale of the Valley, we understand the need to promote an economic and service center. A new space of centrality that would provide the infrastructure, the employ and the services that the municipalities cannot afford by themselves due to seasonal population. A place that will take the complementary opportunities and they network synergies of their context to optimize resource and win efficiency.

Green regeneration, the valley scale

We start with the intention of addressing the proposal from a new disciplinary position called landscape urbanism; understood as a holistic project that takes ecological and infrastructural dimension of the environment for the definition of urban fabric and its social, economic and environmental identity.

Identity, centrality, accessibility, cross thinking, mix of uses, networking, renewed level of services and facilities to the valley scale, economic development and social cohesion are the paradigms and objectives on which the proposed action is based.

The central location in the area, the potential population, high visibility, good regional and regional connectivity, turn this strategic position.

The landscape values of the Huerta, it's water system and the ecological potential of “La Font” ravine are the main resources of the place.

The common work of all a involved administration in charge of the geographical and functional territory, to lead the decision making process, and to have a territorial strategic vision is the big challenges for implementation of the ideas.

A group of projects at this scale, will help to fit those objectives as the landscape corridors to link the coast with the villas providing natural space and added value services.



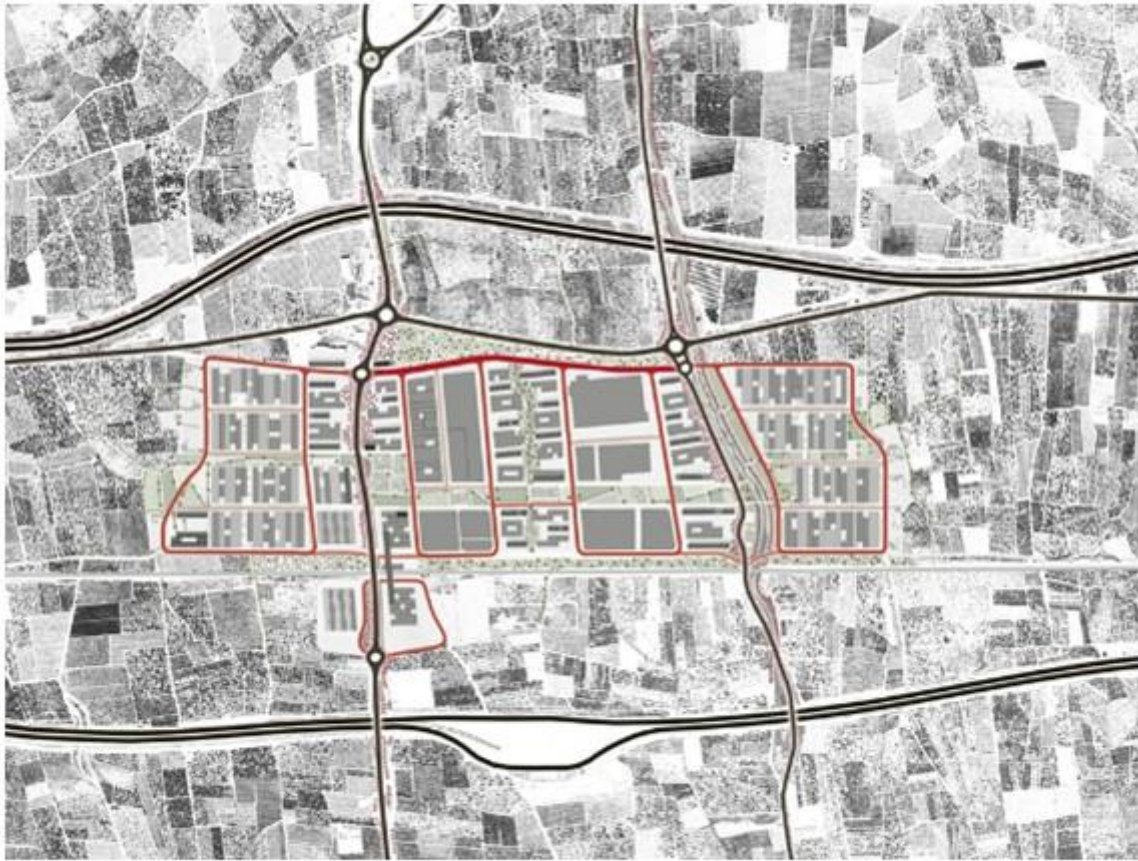
4. Propuesta conceptual de intervención sobre el territorio

Road Structure

It is proposed a diversified and hierarchical road & paths systems, that foster a sustainable mobility and give priorities to the pedestrian and cycle over the private car. This structural system will ensure the full functionality of the tertiary and industrial activity, with optimized routes.

The first action is to split the internal circulation of the existing industrial park from the intercity path network, avoiding interference between them. Within this network two access points are enhanced, by two roundabouts that provide access from the intercity highway to the internal road system. In both cases a second roundabout allow to split the traffic from the coast to the municipalities from the inner traffic.

It creates four inner road rings who are in charge to provide access to all existing and new urban fabric. At the third level are the paths connecting the four inner road rings, avoiding discontinuity and allowing specific cross connections. Finally a capillary network of roads provide access to the inner lots, avoiding interference with the distributions roads.

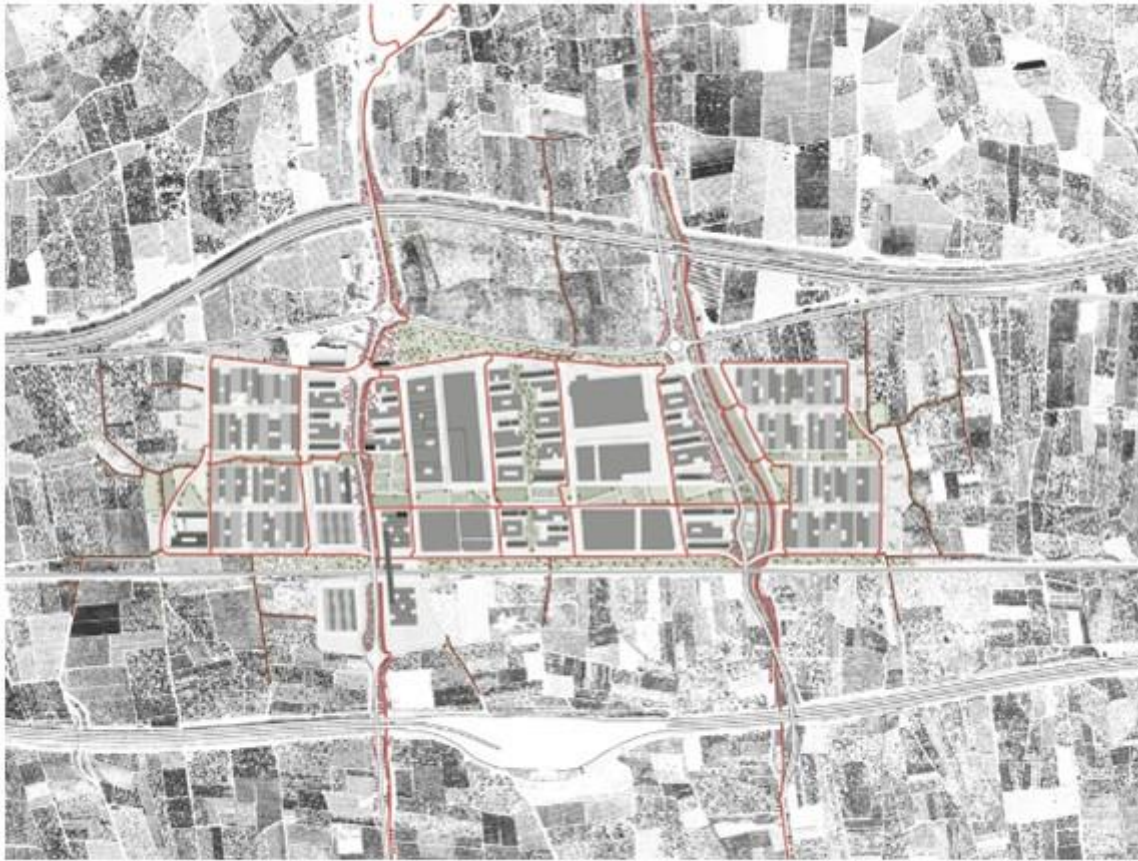


5. Hierarchical road & paths systems

A pedestrian and cyclist extensive path network connecting all points inside the area is proposed. This network is structured from the system of open spaces of the business park, and is linked on many points with the system of rural roads of the territory.

The numbers of existing bus stops are increased to serve the entire area, ensuring accessible distances from any point.

Around the central railway station, a major stock of protected land for parking cars is created, the aim is to foster in the community the use of train service for travels outside the valley.



6. Pedestrian and bicycle network. From the mail axes to the capilar network

Facilities and open spaces

A network of open spaces and facilities, articulated between them, is responsible for structuring the different scales of centrality, provide the level of services and the necessary identity to each areas and to the whole urban system by the interaction between the space needs, the latent values of the physical substrate and the opportunities of the regional model.

Two scales of open space:

1. The first one with a strong territorial character is formed by the two major vertical axes that are aim to overcome the barriers of infrastructure and connect the municipalities of the Valley to the coast. One based on the renaturation of the channel of the "Font" ravine, characterized by the recovery of the riparian forest; and another through the landscaping of the high centrality road CV320, with the higher record of local traffic around the area.
2. The second scale necessarily linked to the former in its two largest urban areas of strength and is responsible for articulating the public spaces inside the business park across different areas and scales:

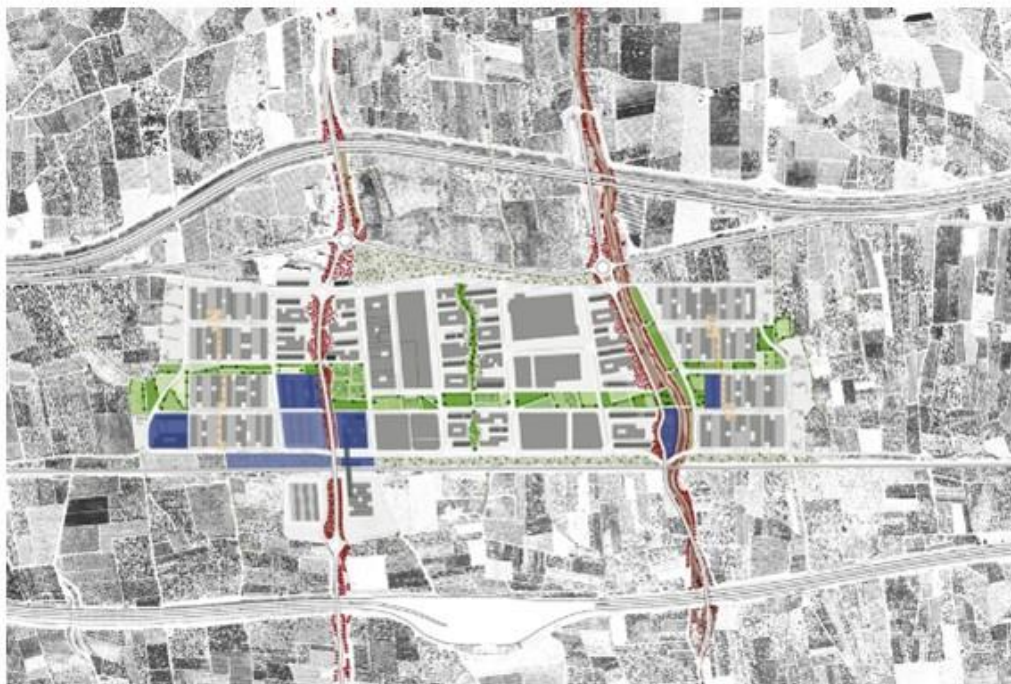
A large square as the main space of centrality in business park, around the exchanger of the train station of "Le Valls". Here are located the main urban facilities and services:

- A congress centre whose aim is to foster the economic activity, while should increase visibility and quality.
- A business incubator centre, a public project as an incentive for the development of business in the valley.
- A parking that will support the modal node.
- A shopping center with a traditional and organic agricultural production, adding value and complexity to the central node, while provide services that could bring new market beyond the Valley.



7. The central square urban design.

The current green axis redesigned connects the central square with the large linear park ravine "Font" and link with the new development area in the north. To limit the maintenance activities, engage with the local culture, and guarantee the urban intensity of this green area, It's developed a system of urban gardens, that could also provide sustainable food.



8. Open Space & facilities

In both expansión areas in the north and in the South, has been designed a new system of open spaces connected to the main system by intermediate-scale facilities (sports, recreational, cultural, health care) and a new green corridor that will create a central space of intermediate scale to solve the edge of the new business park.

In the nearest scale within these new growths one systems of pedestrian streets and small squares that are suitable for the development of activities and private services will provide the quality and extent of urban intensity we seek (cafes, banks appear nurseries ...).

The green infrastructure

The main elements of the proposed green infrastructure are structured in three functional program with different landscape design response.

For the big central green corridor, the landscape draft is based on the previous rural structure. The proposal is to maintain and recovery of traditional plot structure of the Valencian Huerta, and the use of regional ornamental and aromatic plants, which have been historically used.



9. Master plan

Linked with the inner network of green space, but related with a regional scale intervention, a cycling and pedestrian runway parallel to the Font ravine is proposed. This practical motivation will allow us to retrieve the climax vegetation of the ravine, which will positively influence the recovery of birds and wildlife associated with these habitats.

The third level of intervention is based on the recovery of Mediterranean forest landscape, as an element of the urban edges. Major earthworks needed to implement necessary road infrastructure for operation; will supply the geomorphological structure for this new landscape draft.

Sustainability and local weather

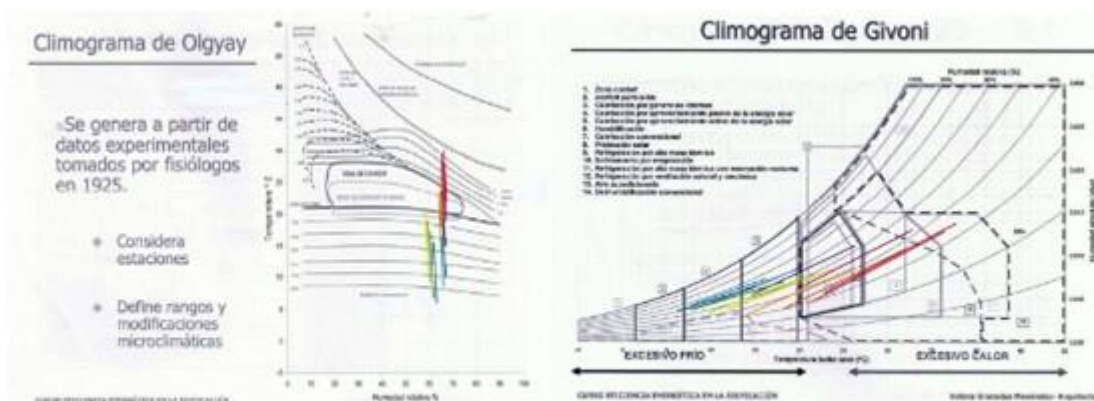
For the development of the urban plan and with the objective of determinate the most appropriate design strategies in response to the unique micro-climate and boundary conditions, a detailed analysis of the most relevant weather aspects is performed.

Prevailing winds

The winds are characterized by a moderate velocity variations. The highest annual rate corresponding to maritime winds from NE to SE due the effect of the sea. You can see a marked seasonality. Maritime winds predominate in the summer, and in winter the westerlies or continental sector. This shows the strong influence of the mechanism of thermal breezes emerged response terrestrial and marine area.

Comfort chart for passive strategies. Outdoor and indoor spaces

From historical weather data for the area and used Olgyay and Givoni Psychometric chart, we define the proper design strategies for both the urban space and for the building design. The traditional architecture strategies are always in the core of the draft.



10. Olgyay & Givoni Psychometric charts

Passive strategies for open space and building design

- Sun protection on the outside and inside.
- Natural cross ventilation
- High wind permeability in urban design and building
- Maximum sun exposure of buildings, establishing a separation between buildings parameters depending on the orientation and the solar height in each case.
- Increase of solar gain areas in the south, more easily to protect from sun radiation.
- Use of inner yards as a thermal regulatory structure.
- Elongated shapes predominating eastward west.

Strategies for sustainability beyond the climate issue

1. Urban Morphology: urban complexes with a high density and compactness, ensuring efficient land use, and continuity between natural systems.

2. Quality public space:

- A proportional distribution of the public space allocated for pedestrian and bike related to the space dedicated to the road structure.
- Public spaces for pedestrians with high quality conditions both dimensional design and environmental.
- Free space inside the lots with an green area of 30% as a minimum.
- Thermal comfort in the public space on a weighted combination of sunny and shady areas.
- Acoustic comfort, from the allocation of land uses, gathering together areas by similar noise levels.

3. Mobility and Facilities:

- Quality public transport, ensuring one stop within 300m from any point.
- A network of cycle and pedestrian paths connected and with high environmental quality.
- Provision of bicycle parking spaces in the public space and building.
- Hierarchical structure of the road network, separating the routes of passage, internal routes, and provide adequate parking for private vehicles at all levels.
- Management of urban infrastructure services, seeking greater efficiency in its design and in its flexibility to adapt to changing realities.

4. Urban complexity:

- Mixed use, and activities in all areas and at all spatial scales, to foster from the early allocation of uses in the urban design an intense urban fabric
- Proper and balanced facilities at all urban scale.
- Simplicity of urban design that promotes safety, orientation and identity of all public spaces.

5. Urban metabolism:

- Energy self-sufficiency in a commitment to clean energy, studying the possibility of implementing a cogeneration of heat and electricity from biomass from crops or forestry or wood chip waste with sustainable forest management. The Mediterranean pine forest of urban edges of the proposal may provide part of the biomass.
- Incentives in the allocation of plots for those using geothermal energy in the buildings. (Quite feasible by the proximity of the underground water level)
- Self-sufficiency in water demand.
- Biological treatment of stormwater purification by large plant surfaces.
- Proximity of waste collection and minimization of impacts arising from the management of them.

6. Green urban infrastructure:

- Proximity of open spaces in all areas and at all levels.
- Soil permeability.
- Dotación de arbolado adecuada en el espacio público, with net zero water use.
- Proximity to urban areas of the regional green corridors.
- A percentage of the building with green roof

7. Social cohesion:

- Identity, simplicity and quality of the public space, with the proper provision of facilities and utilities.
- Recognition of the cultural values of the environment in search of local identity.
- Flexibility in the supply of land to better adapted to business demand for land.



11. Green urban infrastructure

Building Ordinances

Requirements / regulations on energy consumption / sustainability for building ordinance.

1. Dimensions and typologies:

- 100% of the work spaces receive natural, direct or indirect lighting.
- There will be no living or work space within 7.5m of exterior facade or patio with solar access.

2. Solar Accessibility:

- Minimum yard dimensions and distances to boundaries depending on the height of the adjoining and solar incidence angle. 27° to the south. 15 ° to the east and west.
- No space exclusively north-oriented.

3. Limitation of the total energy demand.

4. Wind permeability:

- Exposure is allowed to wind including all facades overlooking the inner courtyards.
- The courts shall have ventilation openings to the wind.
- The buildings will be permeable to the passage of the prevailing wind directions at 30% of its facades.

5. Natural ventilation minimum requirements:

- Workspaces with 75% double orientation.
- Minimum operating facade elements 5% of the soil surface linked.

6. Impermeable surface outside areas: minimum surface sealing of land outside the footprints of buildings (80% must be permeable to water).

7. General Systems:

- System of collection, treatment and distribution of gray water for flushing toilets and irrigation in each lots.
- Collecting rainwater, minimum dimensions of the tank 0.12 m³ / m² of floor surface waterproofed.
- Central system overflow rainwater additional flood area and free irrigation system.
- Collection system and waste disposal.
- Control system of industrial effluents.
- Pretreatment of industrial wastewater in situ.
- Bicycle parking shall be provided.

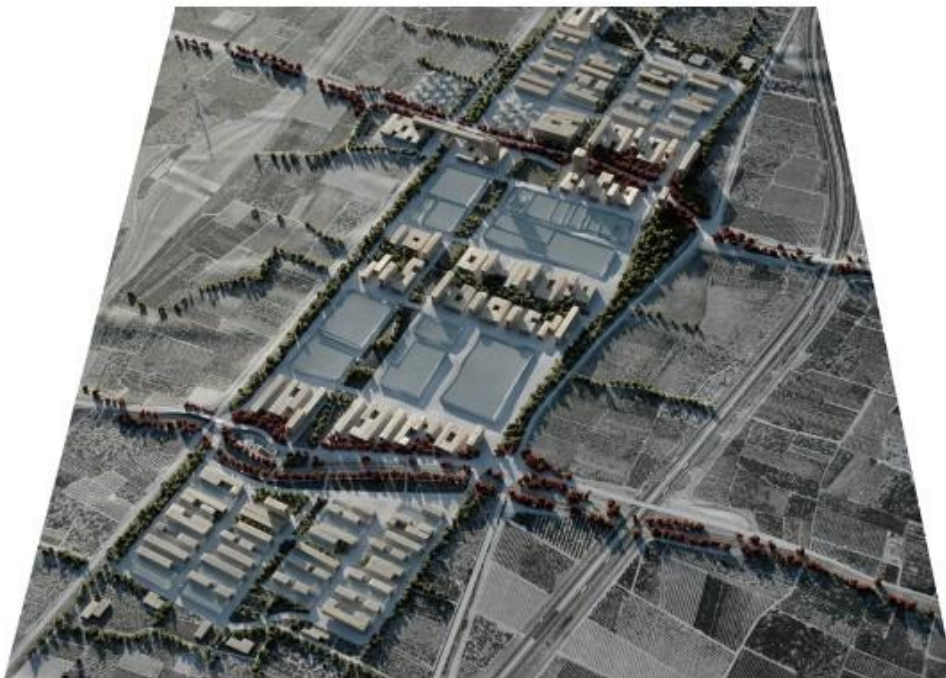
8. Environmental impact of the construction materials:

- Minimum life cycle energy cost and low emissions for the indoor air quality.

- Materials with high durability and tight maintenance costs.
- Local construction techniques will be incorporated.
- Distances to material production site will be controlled, to foster the use of materials manufactured 100 km from the site.
- CE Marking.

3.8.3. Concluding remarks

The theoretical paradigms that support the Case Study are validated if you could consider that the result of work shown an increase in the efficiency and the opportunities in the path to the low carbon growth.



- Unitary management of territory. The common work of all a involved administration in charge of the geographical and functional territory, to lead the decision making process, and to have a territorial strategic vision.
- A Sustainable mobility, that promotes the pedestrian, the cycle and the public transport.
- A territorial polynuclear structure of centrality, as a tool to foster a territorial balance and optimize network synergies.
- Mixed uses against functional specialization. A tool to guarantee the social and economic success of the redeveloped industrial and technological park. At the same time to get an always alive and intense urban fabric.
- Improving the existing urban framework versus a new land occupation.
- Renewed relationship between city and nature, from the idea of "urban reserve" to a balanced space. Landscape urbanism as Holistic project that establish a fruitful relationship with the environment.
-

1. Arquitectura Véliz (Spain)
2. PRAyU SLP (Spain)
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3.9 Energy and Comfort in School Buildings in the South of Portugal

Eusébio Z. E. CONCEIÇÃO^[1], António F. M. SOUSA^[2]

3.9.1 Introduction

In recent years, energy efficiency has attracted people's attention as the most realistic of measures to reduce global warming.

Currently, energy consumption and thermal comfort are two important aspects to consider in controlling the HVAC (Heating, Ventilation and Air Conditioning) as these are widely used in industry and buildings, particularly in tropical and subtropical regions. Moreover, as user requirements for such equipment have been changing from the simple heating or cooling to an increasing demand for high levels of comfort, the control of thermal comfort plays an increasingly important role. Therefore, it is necessary to design control HVAC systems with high levels of comfort and energy saving (Liang and Du, 2008), (Nassif et al., 2008) and (Freire et al., 2008).

So far, various types of HVAC control systems have been proposed. Generally, these can be divided into two types: one type of regulator air temperature (RTA) and other types of thermal comfort regulator (RCT). Currently, the RTA type is widely used in most control of HVAC systems and some of them also take into account humidity; these systems use mainly on/off and PI controls (proportional integral) due to their low cost. However, some more advanced control algorithms have also been proposed in order to improve the performance of these systems. Although the RTA type can effectively keep temperature/humidity within the desired limits, it cannot obtain the best thermal comfort level for the user. Thus, in recent years, the RCT type, based on comfort indices such as the effective temperature and the PMV (predicted mean vote), has been gathering increasing interest (Liang and Du, 2008). The most frequently used index is the PMV, proposed by Fanger (1972), which is a nonlinear function of the following variables: air temperature, mean radiant temperature, air humidity, air velocity, level of activity and level of human clothing. Thermal comfort has great influence on productivity and welfare of occupants of a building. The majority of HVAC systems for thermal comfort are based on a single loop or temperature control, or in some cases, a multivariable control loop with temperature and relative humidity. However, when it concerns the optimization of thermal comfort, other parameters must be taken into consideration, so that the occupants feel effective thermal satisfaction (Huh and Brandemuehl, 2008). Interactions between people and the thermal envelope are complex and have been subject to various studies; therefore the science of thermal comfort takes into account all these aspects (Freire et al., 2008).

The operation of a HVAC system becomes difficult when trying to simultaneously optimize the energy consumption of the building, ensuring the comfort of the occupants and to preserve air quality. The operation of HVAC systems can be improved by optimized control strategies

supervision (Ma and Wang, 2006). Control systems based on models and analysis tools are essential instruments to previously identify problems and find solutions during the project phase (Sane et al., 2006), (Mendes et al., 2008), (Axley, 2007) (Song et al., 2008), (Redfern et al., 2006) and (Komareji et al., 2008).

Yan et al. (2008) used a model of optimal adaptive control with the aim of finding the global optimum and meeting the requirements of time and precision in a HVAC control system. The optimal adaptive control model includes a model of optimal control parameters for the identification and optimization algorithm. Hongli et al. (2008) uses a new "fuzzy" control strategy based the tuning of PID parameters control in HVAC systems. It takes advantage of the fact that the PID controllers are widely developed technologies to improve the design of the "fuzzy" controller that is applied to the temperature control of HVAC systems. Ly et al. (2007) propose and apply a new "fuzzy" control strategy, converted directly from the PID controller for temperature control in HVAC systems to extend the application and non-linear characteristics of fuzzy controllers. Hong et al. (2007) propose a new predictive functional control based on the "fuzzy" model of Takagi-Sugeno (TS) to control HVAC systems. The "fuzzy" TS model of a process control is stabilized using the method of least squares, so that, from the overall linear predictive "fuzzy" TS model, the process is controlled by the functional predictive controller. Hadjiski et al. (2007) propose a new hybrid intelligent system in the control of HVAC systems through the integration of multi-agent systems (MAS), dynamic ontology (OD) and optimization "ant colony" (ACO). The combination of relevant data driven directed known methods and results in a significant improvement in all behavioral indices of the HVAC control system, such as the speed, stability and rate of internal communication, and is robust against disturbances and uncertainties. Liang and Du (2007) developed an intelligent control system for comfort (SCIC) combining human learning and control strategies for minimum power. Based on the PMV index, human learning strategy is designed to tune the comfort zone of the user through the learning preferences of a specific user comfort.

Leehakpreeda (2008) proposes a method for determining the indoor temperature of comfort to control HVAC efficient systems installed in a dynamic environment. The satisfaction of occupants based on the thermal comfort varies according to how the fresh air temperature "set point" of a conventional HVAC system can be properly adjusted (it is usually fixed) when the indoor environment varies over time. As it is not known in advance, the outdoor temperature is systematically calculated by a predictive model. The theory of adaptive comfort model (TCA) captures the relationship between the indoor comfort temperature and the outdoor temperature based on the previously known thermal comfort data, obtained in an environment with real occupants. The indoor temperature of comfort provided by the predictive and the ACT models may be assigned as the reference temperature to control HVAC systems.

Donaisky et al. (2007) propose two control schemes for HVAC systems using the model based predictive control (MBPC in English terminology). Using two strategies explicitly based on computing the PMV index. This index is used as a first strategy, to generate the signal corresponding to the operating point of the HVAC system; a second strategy uses the PMV index to define the predictive model.

3.9.2 Numerical Model

The program used in this study, developed by the same authors, simulates the thermal response of buildings with complex topology and evaluates the average quality of the indoor air (validated in winter conditions in Conceição et al. (2004) and in summer conditions in Conceição and Lúcio (2006a)). It calculates the air temperature inside the compartments and conduits, the temperature of the layers of the opaque bodies of the building (walls, plates, doors, floors, roofs ...), the temperature of the transparent bodies (windows glasses), the temperature of the inner bodies, the mass of water vapor and other gases inside the compartments and the different systems of ducts, the water vapor on the surface of the building bodies, the water vapor and other gases in the solid matrix of opaque and inner bodies, the relative humidity, the average velocity of the air and the mean radiant temperature inside the enclosures.

In addition, the software calculates the incident solar radiation on the outer surfaces, the sunlight transmitted through the windows and striking the surfaces of the compartments, the heat exchange by radiation between the outer surfaces of the building and the sky or the surrounding surfaces, the radiative exchanges verified between the different compartments, the radiative properties of the glasses, the coefficients of heat and mass transfer, the shape factors inside each compartment, the average level of thermal comfort in every space, the heating power for the cooling / HVAC system, among other parameters. More details can be found in Conceição (2003), Conceição et al. (2004), Conceição and Lúcio (2005) or Conceição and Lúcio (2006a).

3.9.3 Input Data

The numerical study was performed at the Campus of the University of Algarve Gambelas Teaching Complex (see Figure 1). This building is primarily used for school activities.

The simulation presented in this work was held on the 22nd of December, in winter conditions, and on 22nd of June, in summer conditions. In order to take into account the thermal inertia of the building, the previous five days were simulated, and only the results of the last day were considered.

The occupation cycle used in this study considers classes for a period of 1 hour and 15 minutes and 15 minutes intervals. It includes a statistical study of the evolution of the occupation of the different rooms of lectures and theoretical-practical classes, hallways, offices, among others.

As input data for the model, concerning the environmental variables during the days of the simulation, measured values of air temperature, relative humidity, wind speed and direction were used, whereas the direct and diffuse solar radiation were numerically calculated from a set of empirical equations presented in Iqbal (1983).

The ventilation strategy used in this preliminary work is to maintain a constant renewal rate, all day long, 2.5 renewals per hour. According to preliminary studies in these areas, this value provides a good compromise between air quality and thermal comfort in such spaces.

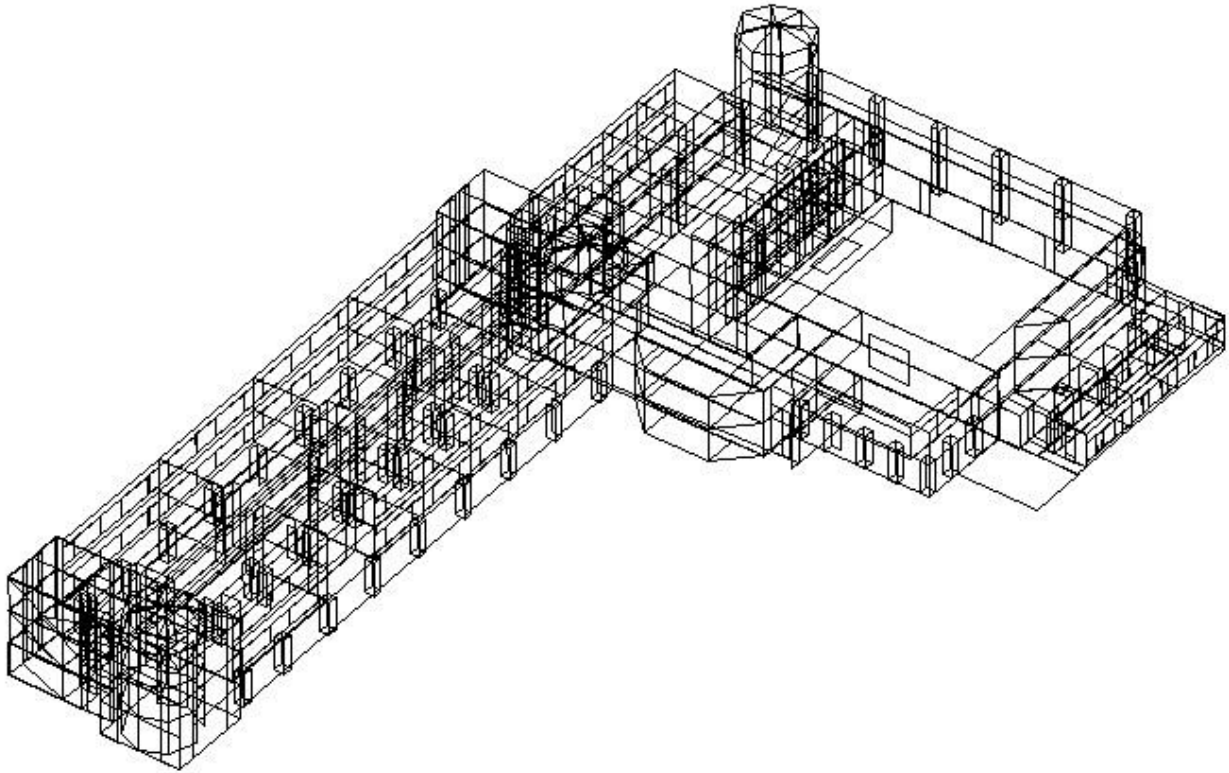


Figure 1 – Scheme of the Teaching Complex.

3.9.4 Implemented Control System

The system implemented is designed to control, rather than the traditional value of the air temperature, the PMV index, which is based on the values of air temperature, air velocity, relative humidity, mean radiant temperature, level of clothing and level of physical activity.

This system ensures acceptable levels of comfort according to Category C ISO 7730 (2005), that is, in winter conditions the heating system is on when the PMV index is lower than -0.7 and in summer conditions the air conditioning system is switched on when the PMV index is greater than +0.7. This philosophy, according to Category C of ISO 7730 (2005), ensures 15% or less of thermally dissatisfied people.

This philosophy also ensures lower levels of power consumption, because the system, in order to ensure acceptable thermal conditions for 15% of people, considers that in the winter people will be uncomfortable with cold and heat, and in the summer people will feel thermally uncomfortable with heat.

The philosophy of control used in this preliminary study considers the HVAC systems (heating, ventilation and air conditioning) switch on and off. However, in future work a new control philosophy will be applied.

3.9.5 Results and discussion

To illustrate the methodology, some results obtained in classrooms and offices will be presented in this section. In each situation, spaces facing the west and east are considered.

While the simulation is carried out on a continuous basis, the results shown in the following figures were recorded every two minutes. Any fluctuation of the variables between these moments is not displayed.

In Figures 2 and 4 the evolution of the level of thermal comfort and air temperature in classrooms equipped with windows facing East (E) and West (W) is represented. The first picture is associated with summer conditions, while the second figure is associated with winter conditions.

The evolution of the thermal comfort level and temperature of the air in offices equipped with windows facing East (E) and West (W) are shown in Figures 3 and 5. The first figure is associated with summer conditions, while the second figure is associated with winter conditions.

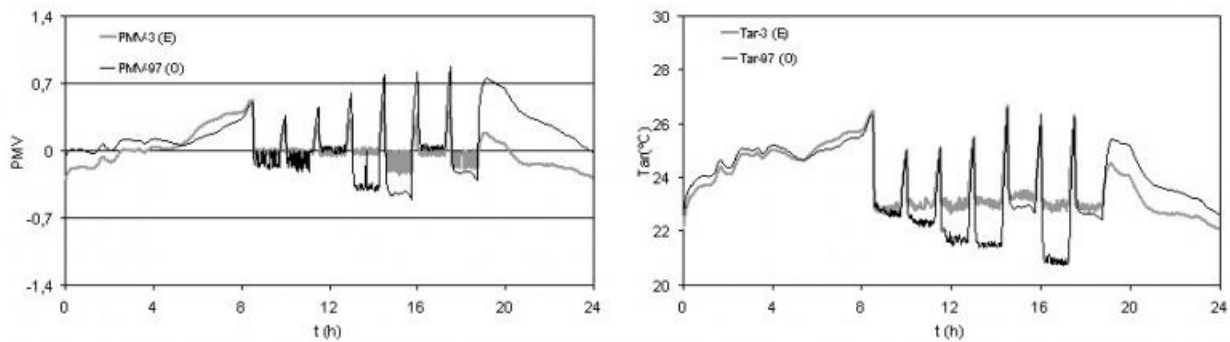


Figure 2 – Evolution of the thermal comfort index (PMV) and the air temperature (Tar) in classrooms with windows facing East (E) and West (O), in summer conditions.

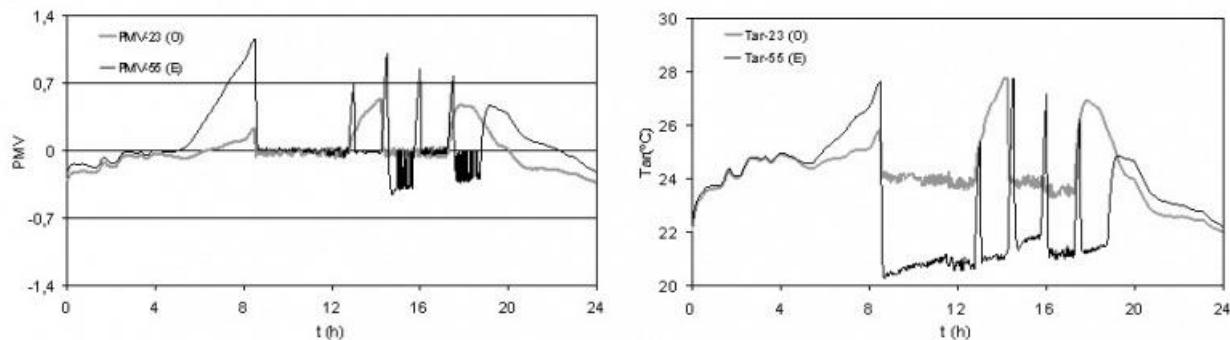


Figure 3 – Evolution of the thermal comfort index (PMV) and the air temperature (Tar) in offices windows facing East (E) and West (O), in summer conditions.

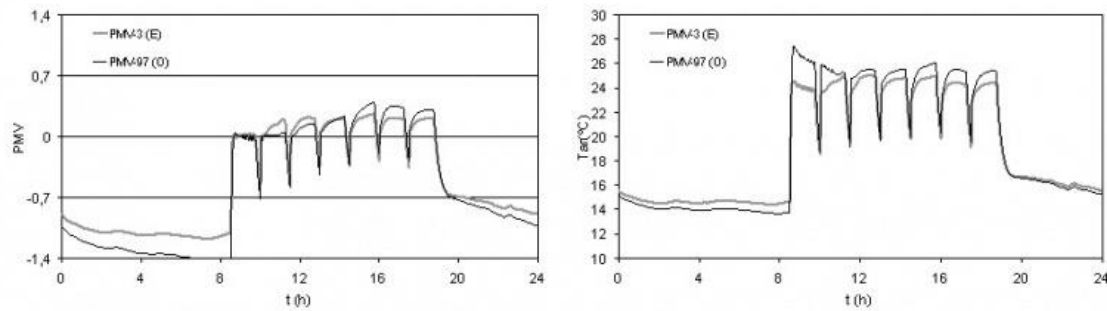


Figure 4 – Evolution of the thermal comfort index (PMV) and air temperature (Tar) in classrooms with windows facing East (E) and West (O), in winter conditions.

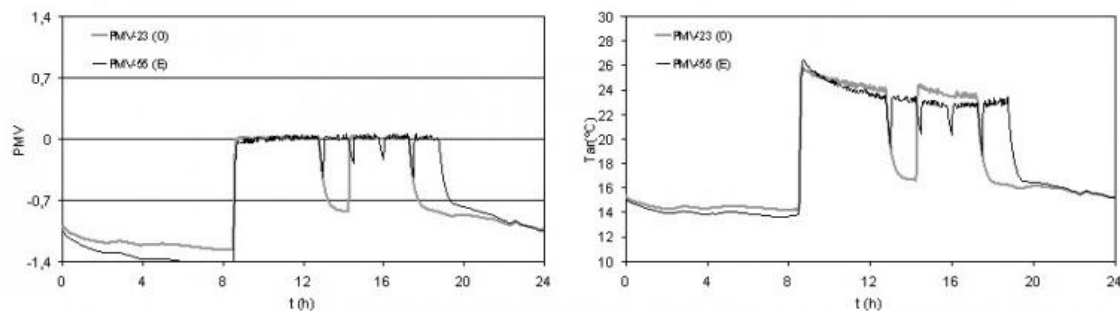


Figure 5 – Evolution of the thermal comfort index (PMV) and the air temperature (Tar) in offices with windows facing East (E) and West (O), in winter conditions.

According to the results, it can be observed that the PMV index, as a general rule, when spaces are occupied, has values within Category C ISO 7730 (2005). However, in many situations, the results fit into Category B or even Category A requirements.

Although the thermal comfort level remains relatively constant, in general, the value of the air temperature is not constant throughout the day. This also depends on the evolution of the other variables, with special attention to the mean radiant temperature.

3.9.6 Conclusions

In this work software that simulates the thermal response of buildings with complex topology and evaluates the thermal comfort and air quality in indoor environments, for the implementation of heating, ventilation and air conditioning systems with intelligent control based on the PMV index.

According to the results, it can be seen that the level of thermal comfort has acceptable values according to category C. However, in many situations, this level is in accordance with category B or even category A.

In order to improve the performance of HVAC systems with minor fluctuations and lower levels of energy consumption, it is suggested in this work that other control algorithms are introduced.

NOTES

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Part 4 Experience Elsewhere and a View of the Future

4.1 Lessons from America

Konstantinos KONSTANTINOU^[1], Iakovos SARIGIANNIS^[2]

4.1.1 Introduction

The concept of Eco-Industrial Parks has its origin in the United States. It was first formalized by Indigo Development in 1992-93. The latter consisted of a team of people from Dalhousie University in Nova Scotia, and Cornell University's Work and Environment Initiative. In 1994, the U.S. Environmental Protection Agency (EPA) awarded a contract to Research Triangle Institute and Indigo to flesh out the concept and undertake a case study. The Agency then embodied this concept in an Environmental Technology Initiative project, which led to the President's Council on Sustainable Development defining 5 major characteristics of a successful EIP to help guide EIP development. These characteristics include:

- some form of material exchange between multiple separate entities,
- industries within close proximity to each other,
- cooperation between plant management of the different corporations,
- an existing infrastructure for material sharing that does not require much retooling, and
- "anchor" tenants (large corporation with resources to support early implementation).

The Council also funded the development of a number of eco-industrial parks as demonstration projects in 1996^[3]. By the fall of 1996, 17 projects declaring themselves eco-industrial parks were on the drawing boards in the United States. At least two had recruited their first tenants^[4]. By 1998 designated sites included the Cabazon Resource Recovery Park (CA), Cape Charles (VA), Chattanooga (TN), Civano (Tucson, AZ), East San Francisco Bay (CA), Fairfield Park (Baltimore, MD), the Green Gold Initiative (Buffalo, NY), the Green Institute (Minneapolis, MN), Londonderry (NH), Mesa del Sol (Albuquerque, NM), Plattsburgh (NY), Riverside Eco-Park (Burlington, VT), Trenton (NJ) and Triangle J Council of Governments (NC)^[5]. A more comprehensive list of existing and developing Eco-Industrial Park Sites in the U.S. has also been published at http://gei.ucsc.edu/eco-industrial_parks.html, as well as at http://www.smartgrowth.org/library/eco_ind_case_intro.html and http://www2.ucsc.edu/gei/eco-industrial_parks.html.

Moreover, the Economic Development Administration, U.S. Department of Commerce and the Environmental Protection Agency funded the development of the National Center for Eco-Industrial Development, a joint project between Leonard Mitchell (USC) and the late Ed Cohen-Rosenthal (Cornell University) in order to develop tools to expand the development of eco-industrial parks through-out the United States. Further initiatives have been launched, hence leading to the development of several relevant areas in the country^[6].

The Eco-Industrial Park (EIP) concept has also been spread in Canada, where it has enjoyed some success. The best known example is Burnside Park, in Halifax, Nova Scotia. With support from Dalhousie University's Eco-Efficiency Centre, the more than 1,500 businesses have been improving their environmental performance and developing profitable partnerships. Subsequently, two greenfield industrial developments have been started in Alberta: TaigaNova Eco-Industrial Park is in the heart of the Athabasca oil sands, while Innovista Eco-Industrial Park is a gateway to the Rocky Mountains ~300km west of Edmonton^[7].

The idea of planning EIPs has retained gathering momentum in academic, business, and political circles. Up to date numerous communities in the US, Asia, Europe, South America, and Africa have initiated EIP or other eco-industrial development planning processes.

One of the most renowned cases of Eco-Industrial Parks in the U.S. has been Devens Regional Enterprise Zone in Massachusetts. According to Lowitt (2008), "Devens has become a model for successfully organizing a light industrial area for involving small to medium sized enterprises as well as larger firms". By applying the concept of sustainable development in a holistic way it has illustrated "that economic development, social equity and environmental protection can operate harmoniously"^[8]. As Peter Lowitt, FAICP, Director – Devens Enterprise Commission has stated it:

- "We have embarked on a holistic approach to redeveloping this former Army base – ranging from housing to providing industries a path toward sustainability through our Eco-Star program and Eco-Industrial networking opportunities.
- We have reduced the mental distance between firms at Devens
- Many of the firms see themselves as part of a system of industries
- We have a number of by-product exchanges but no major process exchanges at this point
- We are currently providing collective waste disposal, byproduct exchange facilitation; reuse/recycling services to all firms and residents at Devens, expandable to businesses in the region at some point in the future.
- Launched Regional HHW facility 2011"^[9].

The following pages present the "Devens Regional Enterprise Zone" (Massachusetts, United States) case. It comprises part of an article entitled "Defining and evaluating sustainability of Industrial Parks" that has been presented by Andrea Cecchin in the framework of the handbook "Green marketing for industrial areas" that has been written within the project Ecomark-Eco-marketing^[10].

4.1.2 Promoting Sustainability within an Industrial Area: the Devens Case (U.S.A.)

Although a shared system to evaluate industrial park sustainability does not exist yet, some experiences are making a great contribution to this topic. Among them, the "Devens Regional Enterprise Zone" (Massachusetts, United States) is an industrial area that "attempts to illustrate that economic development, social equity and environmental protection can operate

harmoniously", trying to apply the concept of sustainable development in a holistic way (Lowitt 2008).

Within the strategies developed to achieve this ambitious goal, in 2005 the Devens Enterprise Commission launched the EcoStar program, in order to "promote sustainable development by integrating economic, social, and environmental needs while maintaining and enhancing the natural resource base in the Devens area" (EcoStar, n.d.). The EcoStar initiative wants to foster a cooperative approach among members in order to reduce environmental impact and save local resources, commit a continuous improvement and innovation, protect ecological systems through an environmental management and strengthen business accountability. In addition, it seeks to build partnerships aimed at spreading a sustainable development approach among enterprises, organizations and local community.

To promote and support the EcoStar Program, several tools have been provided, like guidelines, information meetings, workshops, roundtables, public events, technical assistance and a centre to promote eco-efficiency (Devens Eco-Efficiency Center).

The heart of this approach is a series of standards that businesses have to meet in order to get the status of EcoStar Achiever and its related benefits. Twenty-five standards have been defined (the last one is an open standard) and they involve economic, environmental and social issues. Firms that want to join the program must fulfil at least fifteen standards. These are (Devens Enterprise Commission 2005):

- Environmental vision and policy statement
- EcoStar coordinator and employee team
- Annual assessment and goal setting for continuous environmental improvement
- Employee training and involvement in EcoStar
- Business linkages to improve efficiency
- Involve suppliers
- Educate customers
- Share information with the community
- Water conservation
- Energy efficiency and conservation
- Green building design
- Toxics use reduction
- Material reuse
- Recycling

- Product design
- Packaging
- Environmentally preferable purchasing
- Ecological landscaping
- Create corridor or habitat for local wildlife
- Equipment maintenance
- Involvement with community environmental projects
- Transportation
- Business to business mentoring
- Climate change mitigation
- Create your own standard

Businesses participating in this initiative have to achieve the first ten standards and choose at least five more among the remainders. A technical support is offered to the firms during this path and they receive also the EcoStar Action Guide, where they can find suggestions about the definition of the standards and how to achieve them, information on good practices and useful resources, as well as how to document the accomplishment of these goals. This latter point depends on the type of standard: it might be a quantitative indicator (such as a volume of resources), a list of undertaken actions, a statement or an activity report. At any rate, all documentation is checked through a technical evaluation process.

The first ten standards, those that are required, have been selected in order to ensure that all participating enterprises can build or enhance their own environmental awareness (standard 1 and 2), monitor it (standard 3) and disseminate it among the employees (standard 4). Standards from 5 to 8 seek to strengthen the role of business in the network in order to promote sustainability of the local system, while 9 and 10 are focused on efficiency enhancement in water and energy use within the firm. The optional standards (11-25) further extend opportunities of a sustainable improvement by actions to increase efficiency and reduce environmental impact of industrial processes, involve local community and other enterprises, protect natural systems and introduce more quality in design of products, buildings and green spaces.

To date, 20 out 77 companies located in the Devens area are participating in the Program, to which seven more businesses in the region are added (Lowitt 2012).

In spite this area doesn't have a system to evaluate the overall sustainability levels, the degree of involvement within the voluntary tool EcoStar provides, however, a broad indicator: as Peter Lowitt – Director at the Devens Enterprise Commission – underlines, since such project is a strategy to promote sustainability in that area, " participation in our program is one means of assessing our sustainability efforts" (Lowitt, op. cit.).

Taking up the question of industrial park boundaries discussed in section 3, the EcoStar Program highlights the opportunity to act on relations among elements located within the industrial area and external stakeholders (particularly local community, suppliers and customers) to achieve a full sustainability.

The EcoStar project, therefore, fosters a shared concept (sustainable development) by means of a flexible and voluntary tool, allowing different types of enterprises to play an active role through various degrees of involvement. Although this way to promote sustainability is founded on a group of enterprise-oriented standards, it succeeds in building or strengthening the local stakeholder network. This is probably the most interesting aspect of EcoStar: it seeks to foster collaboration and cooperation among enterprises, with local community and other technical and administrative organizations in the area through a proactive and voluntary approach. Consequently, the issue of sustainability is not introduced by a top-down management system (which is often turned out unsuccessful at a local level), but it is promoted through a path of facilitation and change catalysis and sustained by the competitive advantage that sustainable development can provide. In this way, the enterprises are supported by a "network of sustainability promotion".

NOTES

1. ANATOLIKI S.A.
2. ANATOLIKI S.A.
3. <http://www.indigodev.com/Ecoparks.html> [Accessed 8 December 2013]
4. <https://engineering.dartmouth.edu/~d30345d/courses/engs171/EIPs.pdf> [Accessed 8 December 2013]
5. Cited from Indigo Development, 1998 in Pierre Desrochers, 2000. Eco-Industrial Parks: The Case for Private Planning [pdf]. Property and Environment Research Centre. Available at: <http://www.medmeid.eu/wp-content/uploads/2011/04/Eco-Industrial-Parks_the-case-for-private-planning.pdf> [Accessed 8 December 2013]
6. <http://www.usc.edu/schools/price/research/NCEID/> [Accessed 8 December 2013]
7. http://en.wikipedia.org/wiki/Eco-industrial_park [Accessed 4 April 2014]
8. Lowitt, P. 2008. Something in the water? The emergence of a successful eco-industrial park in the US. Available at: <<https://www.planning.org/divisions/environment/guidebook/pdf/ISIEjournal08.pdf>> [Accessed 8 February 2014]
9. Lowitt, P. 2012. Devens. An Eco-Industrial Park. In Swiss Federal Office for the Environment FOEN in cooperation with the ERA-Net ECO-INNOVERA, Workshop on Eco-innovation Parks. Bern, Switzerland, 20th and 21st of September 2012. Available at: <http://www.eco-innova.eu/lw_resource/datapool/_items/item_281/7-eco_innovation_park_devens.pdf> [Accessed 8 February 2014]
10. Cecchin, A. 2012. Defining and evaluating sustainability of Industrial Parks. In: Marino Cavallo, Piergiorgio Degli Esposti, Kostas Konstantinou, ed. 2012. Green marketing for industrial areas. Available at: <<http://www.ecomarkproject.eu/userfiles/documents/Public/Green%20Marketing%20Plan%20Manual/published/HANDBOOK%20OF%20GREEN%20COMMUNICATION%20AND%20MARKETING.pdf>>. [Accessed 5 November 2013]

4.2 European Experiences

Konstantinos KONSTANTINOU^[1], Iakovos SARIGIANNIS^[2], Irene TSAKIRIDOU^[3]

4.2.1 Introduction

Eco-industrial parks require an enabling framework and government commitment. Framework conditions for improved environmental performance seem to be especially favorable in the EU, as during the past decades there has been an emphasis on environmental guidelines being established for larger investment projects and especially for co-funded projects. Incorporation of EU standards is also taking place in terms of legislation, hence providing a ground for industrial ecology strategies, such as the EIP concept. Moreover, the

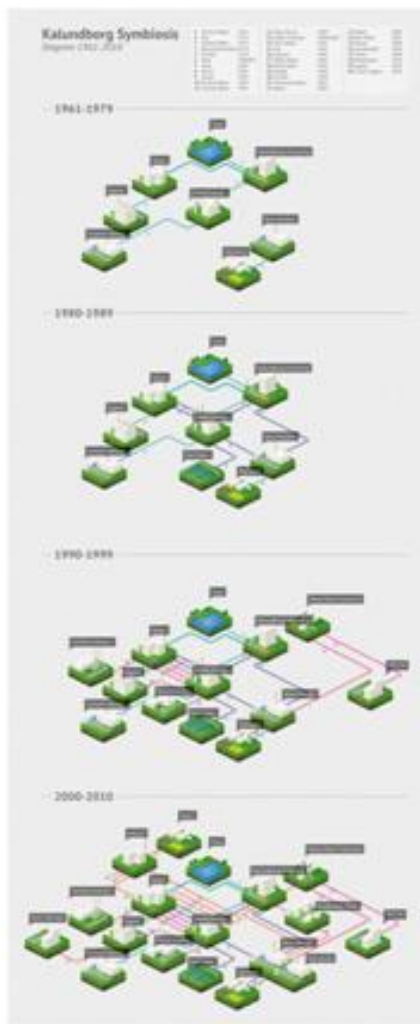
EU's sustainable development strategy (2001) promoted greater energy efficiency and reduced waste emissions, while the Europe 2020 strategy also aims to meet the challenges of resource efficiency, innovation, skills and job creation, and a new industrial policy for the globalised era, through relevant flagship initiatives for smart, sustainable and inclusive growth. Europe is also setting targets for a package of energy targets by 2020 and is introducing initiatives and programmes, such as smart cities and communities.

In this context there have been several examples of European EIPs recognized as best practices worldwide. One of the most renowned ones is the Kalundborg Symbiosis in Denmark; an industrial symbiosis network that came into being as a result of private conversations between a few enterprise managers from the Kalundborg region. Kalundborg became an attractive topic in academia due to its pioneering applications and the deriving sustainability advantages, as well as due to the fact that it put on table the idea of "self organized parks" as opposed to "planned parks"^[4]. As it is stated in the official website of Kalundborg Symbiosis (<http://www.symbiosis.dk/>), "Kalundborg Symbiosis wasn't invented, but has developed organically over the course of five decades". Although Kalundborg developed entirely through market forces, many policy analysts argue that public planners can copy and even improve upon this case^[5].

The following pages present the "Kalundborg Symbiosis" case. Relevant information has been collected from its official website, as well as other useful sources, such as online articles and papers about this exceptional market driven case, in which local companies collaborate to use each other's by products as resources.

4.2.2 Kalundborg Symbiosis

Kalundborg is a Danish city with a population of 16,316 (1 January 2014) and the main town of the same name municipality. It is situated on the northwestern coast of the largest Danish island, Zealand, on the opposite, eastern side of which lies Copenhagen, 110 km away^[6].



<http://www.symbiosis.dk/diagram>

Kalundborg is famous, among others, as the location of the largest coal-fired power station in Denmark, as well as home to the same name industrial symbiosis area. The foundations for the establishment of the Kalundborg industrial symbiosis trace back to 1959, when the Asnæs Power Station was set to function. Over the next decades, many synergies were developed among businesses located in the wider area of Kalundborg, while the term ‘industrial symbiosis’ was used in 1989 to describe the collaboration for the first time. According to René van Berkel (2012) “annual savings based on 2003 figures show that companies together saved US\$ 3.5 million a year, 23 gegalitres of seawater, three gegalitres of surface water and 40,000 gigajoules of heat. This illustrates both the economic and environmental benefits”^[7].

As far as the development of Kalundborg Symbiosis is concerned, the most important milestones, as quoted from the official website and the respective webpage in Wikipedia have been the following: In 1961 plans for a refinery by a near city oil company were put on hold due to a lack of water. For confronting the problem the company constructed a pipeline from Lake Tisso to provide water for its operation. In 1972, Gyproc, a gypsum production enterprise, established a plaster-board manufacturing plant in the area. Gyproc entered into an agreement with Statoil for the supply of excess gas. One year later the Asnæs Power Station was expanded and a connection was built to the Lake Tisso-Statoil pipeline. In 1976 Novo Nordisk, a healthcare company, started delivering biological sludge to neighboring farms and in 1979 Asnæs Power Station started supplying fly ash to cement manufacturers in northern

Denmark. A couple of years later the Kalundborg municipality completed a district heating distribution network within the city that utilizes waste heat from the power plant, while the same year (1982) Novo Nordisk and the Statoil refinery completed the construction of steam supply pipelines from the power plant. By purchasing process steam from the power plant, the companies were able to shut down inefficient steam boilers. In 1987 the Statoil refinery completed a pipeline to supply its excess water used for cooling to the power plant for use as raw boiler feed water. In 1989 a local fish farm started using warm water from the power plant to increase the temperature in its tanks. The same year Novo Nordisk entered into agreement with Kalundborg municipality, the power plant, and the refinery to connect to the water supply grid from Lake Tisso. In 1990 the Statoil refinery completed construction of a sulphur recovery plant. The recovered sulphur is sold as raw material to a sulfuric acid manufacturer in Fredericia. In 1991 the Statoil refinery commissioned the construction of a pipeline to supply biologically treated refinery excess water to the power plant for cleaning purposes, as well as for fly ash stabilization. In 1992 the Statoil refinery commissioned the construction of a pipeline to supply flare gas to the power plant as a supplementary fuel. In 1993 the power plant completed a stack flue gas desulfurization project. The resulting calcium sulphate is sold to Gyproc, where it replaces imported natural gypsum.

A continuously increasing list of entities collaborating within the framework of Kalundborg Symbiosis comprises^[8]:

- Novo Nordisk - Danish company and largest producer of insulin in the world
- Novozymes - Danish company and largest enzyme producer in the world
- Gyproc - French producer of gypsum board
- Kalundborg Municipality
- Dong Energy - owner of Asnaes Power Station, the largest power plant in Denmark
- RGS 90 - Danish soil remediation and recovery company
- Statoil - Norwegian company which owns Denmark's largest oil refinery
- Kara/Novoren - Danish waste treatment company
- Kalundborg Forsyning A/S - water and heat supplier, as well as waste disposer, for Kalundborg citizens

Kalundborg is an example of an eco-park that reduces pollution and shares resources with the community and with other industries. Typical factors identified for such an experiment to be reproduced comprise the following^[9]:

- Proximity between the partners is essential, especially for the facilitation of material flows and exchanges.
- Industries must be different yet fit each other.
- Arrangements must be commercially sound and profitable.

- Development must be voluntary, in close collaboration with regulatory agencies.

As René van Berkel (2012) puts it “Environmental concerns are not always the motivation for this cooperation. A limited network of flows, which could be called kernels, will then emerge, followed by gradual embeddedness and institutionalisation of linkages in which environmental performance becomes a core element binding companies together. An institutional entity then develops - a management company or association of plant owners who commit to improved environmental performance”^[10].

NOTES

1. ANATOLIKI S.A.
2. ANATOLIKI S.A.
3. ANATOLIKI S.A.
4. Pierre Desrochers. 2001. Eco-Industrial Parks, the Case for Private Planning. *The Independent Review*, V, n.3, Winter 2001.
5. *ibid.*
6. <http://en.wikipedia.org/wiki/Kalundborg> [Accessed 10 April 2014]
7. René van Berkel (2012). Eco-Industrial Parks: Industrial parks as a nexus for resource efficiency, industrial symbiosis and eco-innovation. In UNIDO, Conference Report, Europe and Central Asia Regional Conference on Industrial Parks as a tool to foster local industrial development. Baku, Azerbaijan, 17-18 April 2012. Available at: <http://www.unido.org/fileadmin/user_media/UNIDO_Worldwide/Europe_and_NIS_Programme/Documents/Europe%20and%20Central%20Asia%20Regional%20Conference%20on%20Industrial%20Parks%20as%20a%20tool%20to%20foster%20local%20industrial%20development.pdf> [Accessed 8 February 2014]
8. <http://en.wikipedia.org/wiki/Kalundborg> [Accessed 10 April 2014]
9. <http://imaginationforpeople.org/en/project/kalundborg-industrial-symbiosis/> [Accessed 10 April 2014]
10. René van Berkel (2012). Eco-Industrial Parks: Industrial parks as a nexus for resource efficiency, industrial symbiosis and eco-innovation. In UNIDO, Conference Report, Europe and Central Asia Regional Conference on Industrial Parks as a tool to foster local industrial development. Baku, Azerbaijan, 17-18 April 2012. Available at: <http://www.unido.org/fileadmin/user_media/UNIDO_Worldwide/Europe_and_NIS_Programme/Documents/Europe%20and%20Central%20Asia%20Regional%20Conference%20on%20Industrial%20Parks%20as%20a%20tool%20to%20foster%20local%20industrial%20development.pdf> [Accessed 8 February 2014]

4.3 The Chinese Experience

Aphrodite STAMELOU, Irene TSAKIRIDOU^[1]

4.3.1 Introduction

In recent years, industrial symbiosis is one of the biggest trends in industrial ecology with a specific focus on material and energy exchange. Industrial symbiosis is the sharing of services, utility and product resources among neighboring industries in order to reduce costs and generate new revenues, minimize wastes and reduce the environmental emissions. For example, industrial symbiosis is encountered in areas, where waste products from an industrial actor are used to remediate the waste stream of another industrial actor^[2]. Eco-industrial parks (EIPs) represent the main practical way to apply the idea of industrial symbiosis. China has carried out the development of EIPs since 1999 and this development has been guided by the theory of circular economy and the principle of eco-industry for the development of cleaner production ^[3].

Although, the development of EIPs in China reflects a large number of conflicts between economic development and lack of natural resources and environmental pollution, several examples of Chinese EIPs have been recognized as best practices worldwide^[4]. One of the most well-known is the “Guitang Group”, which is a state-owned conglomerate operating one

of China's largest sugar refineries with over 3.800 workers and 14.700 ha land for cultivating cane. For more than four decades, this group has been developing and implementing internal and external industrial symbiosis plans^[5].

“Guitang Group” transformed from a small refinery to an industrial symbiosis cluster. Over the years, “Guitang Group” became a successful complex that utilizes waste from its production processes and by-products of other surrounding industries. This way, Guitang refinery reduces its emissions and other disposal costs. Moreover, the innovative procedures, which are carried out during the industrial symbiosis plan attract well-educated young people for working in the Guitang refinery^[6].

In the following paragraphs, the “Guitang Group” case is presented. Relevant information has been collected from its official website, as well as from other sources, such as scientific articles and papers.

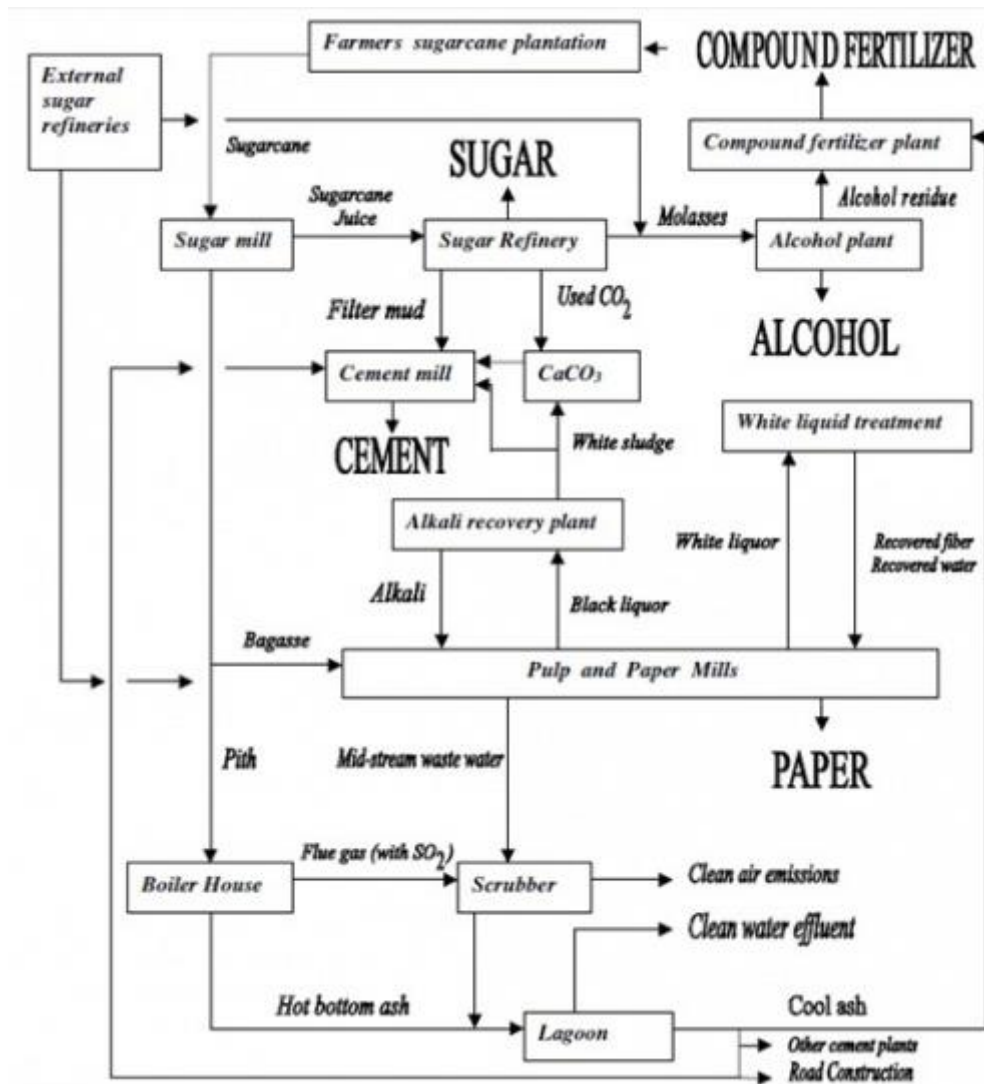
4.3.2 “Guitang Group” Industrial Symbiosis plan

Guigang is a prefecture-level city in eastern Guangxi in the People's Republic of China. Its location makes it a major transportation and business hub, connecting central China with the south, especially Hong Kong and Macau. Guigang covers an area of 10,595 km² and its population is about 4.400.000 people.

The Guitang Group is a state-owned conglomerate operating China's largest sugar refinery. It was established in 1956 and consisted of a sugar refinery and an alcohol plant that used the molasses by-product. Cost of sugar production in Guigang is high due to the large number of small canes farms. This situation results a large amount of by-products that are not used by small-scale refineries and generate high levels of air, soil and water emissions. The main target of the “Guitang Group” Industrial Symbiosis initiative was the reduction of emissions and disposal costs, while gaining more revenues by using by-products^[7]. The industrial symbiosis at the “Guitang Group” includes internal as well as external symbiosis plans.

4.3.2.1 Internal Industrial Symbiosis

In addition to the preexisting units (sugar refinery and alcohol plant) “Guitang Group” added paper mills, which use bagasse as a raw material and developed new business lines, which generate revenues and reduce environmental emissions. During the process each downstream industry uses the by-products from upstream industries as material inputs. There are two product chains, the sugar chain and the paper chain. The sugar chain products are sugar, alcohol, cement and compound fertilizer, while paper chain uses bagasse fibers, which are appropriate for paper-making. Over half of the total bagasse is suitable for paper-making. Finally, in addition to these two production chains, “an energy recovery chain in which the pith is burned in the “Guitang Group” boiler house to power the plant” exists^[8]. Production process is illustrated in the following diagram.



Production process diagram of “Guitang Group”, in Cohen-Rosenthal E. 2003. *Eco-Industrial Strategies: Unleashing Synergy between Economic Development and the Environment*. Greenleaf Publishing Limited. pp. 349–351.

4.3.2.2 External Industrial Symbiosis

Sugar cane is a major part of Guigang economy since 30% of the local people are employed in the sugarcane refineries and industries. The Guigang city government has decided to play a significant active role in the conduct of markets. For this reason, government has established a lowest price, which “Guitang Group” should pay to the farmers. This economical incentive provides higher revenues and security to the farmers, alongside with national policy of reinforcing rural residents. The price, which “Guitang Group” should pay to the farmers for sugarcane purchase is higher than the average price in the rest of the world. According to the Guigang governance, this decision has two explanations. Firstly, in this way the revenues and the income of the farmers will be increased and secondly this will be a sure way to attract new farmers and to encourage the existing farmers in the sugarcane plant.

As regards external industrial symbiosis, “Guitang Group” has created a network consisting of customers, local/national authorities, farmers and competitors. These external relationships contribute to the success of the whole process.

Concerning the relations with its competitors “Guitang Group” has an unusual approach. Due to the construction of new paper mills, the locally bagasse is insufficient for the production requirements. For this reason, “Guitang Group” uses discarded bagasse (by-product) from its local competitors. In the case of smaller competitors, “Guitang Group” buys the bagasse and provides them with an extra income arising from their “waste”^[9].

The production and utilization of high quality cane is very important for increasing the “Guitang Group’s” competitiveness in the market. For this reason, the company has close collaboration with producers of sugarcane by signing long-term contracts with them. “Guitang Group” provides them with organic fertilizers produced by alcohol residue in return for high quality sugar cane, as well as technical assistance in order for them to increase their competitiveness and profit margins. Filter mud is a byproduct of the sugar process and was originally used as a fertilizer despite the damage it did to soil. Instead, the filter mud is now used in the cement production and residues from the alcohol plant (molasses) are used to create a compound fertilizer in the sugarcane fields. A by-product of the sugar production process is the filter mud. Despite its *disastrous consequences to soil this mud was used* as a fertilizer. In the frame of industrial symbiosis plan filter mud is used in the cement production and the residues from the alcohol plant (molasses) are used to create a compound fertilizer in the sugarcane fields^[10].

Concerning the relations with its costumers “Guitang Group” has expanded its sugar sales based on the quality of its products. “The higher quality of its carbonation-refined sugar, compared with the sulfitation-refined sugar of its competitors, has enabled the GG to gain significant contracts with major soft drink companies, including Coca-Cola and Pepsi-Cola, as well as with Wahaha, the largest domestic beverage producer in China”. During the last years, main success of “Guitang Group” is paper manufacturing. This has become a significant achievement in the market and its major profit center^[11].

Considering all the above elements it is easy understanding that industrial symbiosis, both internal and external, generates a large number of benefits for all actors involved. As Zhu et. al (2007) successfully pointed out “For large and medium – sized enterprises that provide intermediate products to other enterprises, it is advantageous to become long-term suppliers to large downstream enterprises with large market shares and high profit margins. The dominance of the sugar industry supply chain—farming, processing, production, and related suppliers in the Guigang region means that the success of the “Guitang Group” and its workers also generates financial and environmental benefits throughout the local economy”^[12].

NOTES

1. ANATOLIKI S.A.
2. Monballiu, A., Chiang, Y., Garsany, C., Meesschaert, B. 2012. Potentials of Regional Industrial Symbiosis on Waste Material Valorisation and Pollution Prevention in West Flanders. Available at: <https://lirias.kuleuven.be/bitstream/123456789/369439/3/WTRS+WTafvalwater+English+version.pdf>
3. Holländer R., et al. 2009. Sustainable Development of Industrial Parks. Available at: http://www.wifa.uni-leipzig.de/fileadmin/user_upload/AP/UL-WiFa_AP81_Hollaender_Wu_Duan.pdf
4. Ling Zhang, et. al. 2009. Eco-industrial parks: national pilot practices in China. Available at: <http://www.sciencedirect.com/science/article/pii/S0959652609003941>

5. Qinghua ZHU, et. all. 2007. Industrial Symbiosis in China: A Case Study of the Guitang Group. Available at: <http://onlinelibrary.wiley.com/doi/10.1162/jiec.2007.929/abstract>
6. Ibid.
7. Cohen-Rosenthal E. 2003. Eco-Industrial Strategies: Unleashing Synergy between Economic Development and the Environment. Greenleaf Publishing Limited. pp. 349–351.
8. Ibid.
9. Ibid.
10. Ibid.
11. Ibid.
12. Ibid.

4.4 Current Challenges and Future Prospects

Konstantinos KONSTANTINOUI^[1], Irene TSAKIRIDOU^[2]

In the present era of intensifying globalization and economic crisis, Europe is facing major challenges that require an ambitious economic policy for the 21st century in order to stay competitive and sustain growth. In this context, the continent's vision for social market economy in the Europe 2020 strategy aims at:

- smart growth, based on knowledge and innovation;
- sustainable growth, promoting a more resource efficient, greener and competitive economy;
- inclusive growth, fostering a high employment economy delivering economic, social and territorial cohesion.

Boosting growth and jobs, by maintaining and supporting a strong, diversified and competitive industrial base in Europe offering well-paid jobs while becoming more resource efficient, is at the heart of Europe 2020 strategy and becomes a crucial part of Europe's response to the economic crisis, along with investing more in research, innovation and entrepreneurship. That is why the Commission has adopted the 2010 Communication “An integrated industrial policy for the globalization era”, a flagship initiative that aims to improve framework conditions for the industry. Furthermore, the Commission adopted the “Innovation Union” flagship initiative that sets out a comprehensive innovation strategy to enhance Europe's capacity to deliver smart, sustainable and inclusive growth and highlights the concept of smart specialization as a way to achieve these goals. All aforementioned strategies need to be seen as means of integrating sustainable consumption and production in the general EU policy framework.

An industrial park may be defined as "sustainability-oriented" if it promotes initiatives aimed at simultaneously pursuing three general goals:

- reduce the environmental load of the industrial area, seeking not to overcome the threshold that ecological systems can sustain;
- produce competitive advantages for the enterprises
- foster improvements in quality of life for workers and local community

In this regard, the promotion of eco-innovation for industrial areas and enterprise zones is strongly related to the general goals for industrial and innovation policy in Europe, as influenced by sustainable consumption and production policy over the years. Considering this, it is possible to propose specific guidelines and observations for policy makers, as well as

for individual industrial areas and companies, in several fields. The examples and practices developed through this Handbook, as well as through the Macro-benchmarking study conducted in the framework of MER project show some critical improvements:

- The application of environmental/ energy management processes is enhanced by the establishment of a Managing Authority that also helps promoting coordination with local entities.
- The existence of financial resources and incentives is a critical factor fostering eco-innovation for industrial areas and enterprise zones.
- Encouragement of environmental/ energy cooperation developed between companies at ad hoc basis might function as a first step for further cooperation and structural reforms at eco-innovative industrial areas and enterprise zones basis.
- Application of environmental/ energy instruments/ protocols/ provisions is highly recommended, especially in relevance to environmental certification (such as ISO 14001, Eco Management and Audit Schemes or national standards, such as those implemented in Italy).
- Cooperation with local community on environmental/ energy issues is a common characteristic for many areas that should also target the promotion of cooperation at wider level than that of their scope. It has to be mentioned that joint plans for promoting sustainable modes of operation and production (such as sustainable transportation, joint plans for waste water and sewage treatment of the area, promotion of cogeneration with more use of renewable energy sources) are practices already in place that should be further enhanced. Cooperation of eco-innovative industrial areas and enterprise zones or their companies with local firms outside an eco-innovative industrial area is something that should be further enhanced.
- Increasing consumers' awareness and knowledge of environmental issues lies within the context of corporate responsibility of the eco-innovative industrial areas and enterprise zones, while it is generally recognized as a means to promote the concept of eco-innovative industrial areas and enterprise zones, as well as their businesses and their products. Again, it needs to be mentioned that the development of initiatives that do not target solely the eco-innovative industrial areas and enterprise zones themselves, but have an impact on the wider area, should be highly prioritized.
- Participation of employees in the promotion of sustainable modes of production and operation is an asset and can be enhanced through their involvement in the Managing Authority Board or more easily by identifying a small range of issues that employees could participate and gradually increase the thematic for their involvement. The existence of certification (such as ISO 14001, Eco Management and Audit Schemes or other) enhances participation of employees. Training, especially on collective basis, has been identified as a positive practice, while it needs to be mentioned that the use of incentives and better information at company level are desired practices for the enhancement of employees participation.
- For what concerns the communication and green marketing, eco-innovative industrial areas and enterprise zones should fully deploy traditional approaches as

communication instruments (website, publications on local newspapers, local TV advertising, etc.) to promote both their attractiveness as potential locations for firms' establishment, as well as their existing firms. Elaboration of green marketing plans will further enhance their position, while developing a brand name for the area could prove to be an asset. Communication capacity is further enhanced through collaboration with local Chambers, Associations, Unions, Authorities, etc., including signing of memoranda and agreements, especially for creating commitments in developing place marketing involving the application of branding and sales strategies to different regions, cities, states or countries.

- Regarding energy supply and use, small dependence on fossil fuels, and application of energy saving systems should be enhanced. Among the practices that should be applied are eco-friendly equipment, energy efficient lamps, double glazing and improvements in buildings' insulation, warmed production air for heating purposes, voltage correction equipment, while monitoring programmes to optimize energy consumption management should also be put in place.
- Regarding renewable energy sources photovoltaic panels, geothermal energy, exploitation of biomass from industry waste and wind energy should be used.
- As far as the water supply and use is concerned, connection to the public water supply system is an asset. Moreover, water saving systems should be applied, such as the use of rain water, the re-use of water from production processes, while new technologies for savings in water consumption also exist. An asset is also considered the existence of an internal industrial water treatment plant and separate industrial water system/circulation. Re-use of treated water (for agricultural purposes, trucks washing, irrigation etc.) is also a practice that should be applied.
- Prevention, minimization, recycling reuse and energy recovery of waste should be put in place. To start with, separate collection at the source, as well as increasing collection points are two improvements that should be made without second thought.
- Physical barriers for blocking noise pollution, minimization of transport movements inside the areas and implementation of low cost monitoring functions should be at the quiver of eco-innovative industrial areas and enterprise zones.
- Logistics and mobility management is a field that despite its potential for improvements, both in terms of environmental impact reduction, as well as businesses savings, has not been properly treated. It is interesting to notice that many of the eco-innovative industrial areas and enterprise zones are located close to major transport infrastructures. Still in many areas cargo movement is made mainly by trucks. The existence of a logistics center inside an eco-innovative industrial area is considered also an asset. Regarding employees and visitors' movement, in some places there is a workers' transportation plan in order for the employees to use public transportation or car sharing. Proximity to residential areas favors the use of bicycles and feet. Simple actions such as increasing bus frequency should also be applied.
- RDI is a field with great potential, since the vast majority of industrial areas and enterprise zones has developed cooperation with scientific research institutions at local, national and/ or international level. It is essential that those initiatives have a

tangible result for these areas and/ or their industries in environmental/ energy field; hence should be connected with products and productive processes or the overall function of the areas. Further, the development of some kind of cooperation with other industrial areas, mostly for the identification and exchange of best practices is an asset. The development of common administrative structures among industrial areas could be further investigated regarding the potential impact to the promotion of eco-innovation. Finally, the existence of Spin offs, Business incubators, Start up assistance is also considered an asset.

In current times, enlightened companies go beyond old-fashioned governmental regulations and rules. They are developing environmentally sustainable strategies and practices in an effort to create a sustainable world economy. Green economy can be a powerful opportunity to tackle the economic crisis and a powerful engine for development. Energy efficiency, green industry and sustainable mobility are key areas to start the transition to green economy, to act not only at the level of individual enterprises but also at level of industrial area and cluster, which means multiplying innovation and cohesion between business entities and institutions and generating economies of scale and greater resonance towards green marketing actions. The relationship between business and the environment should become an element of competitiveness, innovation and growth.

Regarding future improvements, it is worth mentioning that a sense of contraction and initiatives' reduction for the near future is evident, which should be alarming. The financial situation in Europe overall and in MED program countries in particular does not favor investments implemented solely with own financial resources or bank loans, which are rare. Therefore, apart from systemization of relevant best practices in a result-based policy framework, new financing opportunities and instruments should be explored, especially in the context of Operational Programs (OPs) of new programming period 2014-2020. Moreover, the innovative character of eco-innovative industrial areas and enterprise zones certainly should qualify them for funding from other financial instruments, most notably HORIZON 2020, LIFE and Interregional Programmes. By all means, best practices for eco-innovative industrial areas and enterprise zones should be further promoted and disseminated through the next steps that will follow the MER project.

NOTES

1. ANATOLIKI S.A.
2. ANATOLIKI S.A.

4.5 World News

1. Waterfront redevelopment in Slovenia

Prof. Lučka AŽMAN MOMIRSKI

The coastal belt is an exceptional location, where two spatial elements come together: the mainland and the waters of the sea, rivers, or lakes. Waterfront redevelopment has been part of the most important architectural and urban-planning projects since the 1990s, representing a central issue in EU spatial-planning policy. Coastal or river waterfront

redevelopment has been among the most interesting features of urban renewal since 1980, in which the waterfront should be treated as part of the entire urban composition and not only as a special feature or a separate development phenomenon.

The majority of the world's population lives in coastal areas: in Europe, 29.1 % of people live within 50 km of the coast, in Asia 27.1 %, in Africa 18.1 %, in North America 31.5 %, in South America 24.4 %, and in Australia and Oceania 79 % (bibliotecadigital.ilce.edu.mx). A satellite image of the Mediterranean nightscape confirms these findings: there is a clear line of light where the mainland makes contact with the sea.

The contact between the urban structure and the water is an edge ("the basic element that defines the shape of the whole"; Košir 2006: 246) and a dividing line ("that defines a space as a binomial: outside and inside"; Košir 2006: 246).

Various coastal areas were studied in terms of their strengths, weaknesses, opportunities, and threats. The findings of the study Waterfront Redevelopment: Izola East provide the basis for detailed, comprehensive, and versatile prediction of coastal transformations in the northeastern part of what used to be Izola Island. Here, coastal redevelopment has been enhanced in the past two hundred years. This is where Izola's tourism began to develop with the construction of the Vascotto thermal baths, followed by the development of modern industry with the establishment of the first factory in the area, the Emile L. Rouillet et Co. fish processing plant.

The planned construction of islands with the largest tourism resort on the Slovenian coast and in Viližan Bay promoted by Slovenian and international investors would completely change Izola's coastal belt. The location—with its protected natural and cultural heritage sites and industrial activity, some of which remains in operation and some partially abandoned—is under great capital pressure. Slovenian and foreign investors are seeking permission to build three islands in the Viližan Bay and a large tourist resort along the coast. If this plan were implemented, Izola would be entirely different; it would become the largest Slovenian seaside resort. The plan envisages relocating business activities, razing buildings, and moving people.

But a true transformation of the degraded urban area of the eastern part of Izola will only be possible through cooperation between public and private investors, which also brings into question the overly extensive changes in the area in terms of space and the activities there. Improved quality of public space and activities important for social growth such as research and education create opportunities for low-cost industry, small business owners, and young people, and the year-round residents become the generators of the area's development. Taking into account natural and cultural heritage contributes to innovative spatial solutions. Through nature-conservation measures, the integrity of the marine and coastal ecosystems and biodiversity are preserved in parallel to and equally with the development projects.

2. Blue Frontiers

Prof. Lučka AŽMAN MOMIRSKI

In the context of globalization processes and their uneven impact on urban and regional restructuring, cities have promoted various strategies to enhance their competitiveness.

Specific cases are cities and towns located on sea and river waterfronts. The decline of port related economies, on the one hand, and attempts to use waterfront potential for the enhancement of new economic functions and quality of life, on the other hand, led to the development of various urban waterfronts regeneration projects. The WaRe Partnership created a platform for sharing different perspectives, experience and knowledge with waterfront regeneration in five cities: Bratislava (SK), Izola (SLO), Parnu (EST), Venice (I) and Viana do Castelo (P). The WaRe partnership identified a number of key issues from the experience in case study cities and towns developed under three main headings: Bluefield Development, Management & Governance and Regeneration & Sustainability. They emerged as focal questions to be addressed by both, public administrators and private investors and they offer both the overview of experience as well as suggestions for approaching waterfront redevelopment.

Bluefield Development:

- Waterfront as a **land-water interface**;
- Potential of waterfronts to be a principle **gateway** to the city and its **region**;
- It is a **frontier** of natural environment, lasting human nature relations and a contested social space of struggles for economic benefits and enhancing quality of life.

Management & Governance:

- Urban waterfront redevelopment requires **joint management** and collaboration between different actors and levels of public institutions;
- The interests of citizens towards waterfront are kept at the forefront of redevelopment efforts through **public participation** and **transparency in decision-making**;
- Private capital is an essential driving force in reclaiming economic and employment potential of bluefield zones.

Regeneration & Sustainability:

- While reflecting global demand, urban waterfront redevelopment reformulates identities while **respecting historic and local values**;
- The right scale of interventions is essential for **economic efficiency and environmental sustainability**;
- **Socially inclusive waterfronts** maintain physical accessibility and right balance of functional and social mix.

The key issues represent a necessary pre-condition in a process of waterfront transformation and offer a normative approach in achieving an appropriate environment for social-economic and infrastructural development. If the process of waterfront transformation is not in line with suggested components, the regeneration potential of waterfront can turn into a risk for the future city development. Therefore suggested key issues should be in the core of waterfront transformation process. These are related to understanding waterfronts as bluefield sites; they rise the importance of the waterfront as frontier and gateway to the city and its region; they emphasize the strategic approach of the development process, with a special focus on governance, management of the process, its inclusiveness and transparency. Furthermore, the key issues focus on search of new identities while respecting the specific heritage of the site and choosing an appropriate scale of interventions.

The project understood waterfront regeneration as a highly complex process that requires the mobilization of endogenous potentials capable of reaction to the ever-changing context of international competition for scarce resources. Specific attention was given to the assessment of potential and risks of regeneration policies and to the discussion of the roles of key actors in the regeneration process.

Based on the experience from the case study places, it was confirmed that the key actor responsible for sustainable and balanced urban development is the public sector, especially on the local city level. Its main role is to reconcile the need for attracting businesses that goes in hand with the local adjustment to their requirements with the protection, support and enhancement of local values and citizens. For instance the case of Izola is an excellent example of vulnerable position of small municipality when it comes to global investments which propose large-scale projects. However, successful regeneration requires involvement of a wide spectrum of actors from business and citizens sectors. The case of Certosa Island in Venice represents a positive example of Public Private Partnership project. Lessons taken from almost all case studies put into forefront improvement of active citizens participation in decision making and inclusiveness of general public into the process of redevelopment. The needs of clear participatory models for public participation are especially needed in Bratislava, Izola as well as in Pärnu. Even in cases, where public participation is a mandatory step within the municipal planning process, the real involvement is still lagging behind. Beside the accomplishment of economic goals the regeneration outcomes need to be positively accepted by local citizens. Bratislava, in particular, is struggling with the reconciling business and citizens priorities.

Waterfront regeneration projects shall start from the understanding of complexity and variety of situations in waterfront sites reflecting mutual relations between water and land related activities. They shall be developed in favor of bluefield sites (Pinch 2002), taking water based perspective on the (re)development of existing and new activities and functions as the point of departure for any active involvement. Waterfront redevelopment can play a significant role in the overall development strategy for city and its region reflecting gateway functions of waterfronts. The regeneration process is a multifaceted process, which includes spatial, social, environmental, physical, functional and economic aspects. The imperative of sustainable development requires mutually interconnected and synchronized actions of the development in the all above mentioned spheres and reflect thus the key principles defined in the strategy of EU 2020, that emphasize the mutual interrelationships of smart, sustainable and inclusive growth. The WaRe project has shown similarities and differences among investigated case studies and has helped to identify key issues of waterfront redevelopment at the beginning of the 21st century. WaRe experience can provide inspiring lessons for other waterfront cities and towns.

3. Key differences between ISO 14001 and ISO 50001

Javier LÓPEZ

Introduction

Companies face a tide of rising costs, but the challenge of inflating energy costs can be mitigated, or even eliminated, by making energy efficiency and environmental protection a core element of management practice and can lead to sustainable competitive advantage.

An efficient way to implement and control the energy cost is to implement managements systems. A management system describes the set of procedures an organization needs to follow in order to meet its objectives. In a small organization there may not be an official system, just 'our way of doing things'. Often 'our way of doing things' is not written down, instead it is in the head of the staff. However, the larger the organization the more likely it is that there are written instructions about how things are done. This makes sure that nothing is left out and that everyone is clear about who needs to do what, when and how. When an organization systemizes how it does things, this is known as a management system.

Some of ISO's most well-known standards are management system standards. They provide a model to follow when setting up and operating a management system. Like all ISO standards, they are the result of international, expert consensus. Therefore, by implementing a management system standard, organizations can benefit from global management experience and good practice.

These standards can be applied to any organization, large or small, whatever its product or service and regardless of its sector of activity. There are two standards focus on assess the environmental issues of companies, which are: 14.001 and 50.0001. In the following we are going to explain the main differences between them.

Key differences

Although the relatively new international standard is closely aligned to ISO 14001, ISO 50001 is intended to put more strategic influence on the continual improvement of energy performance, including energy efficiency, energy use, and consumption.

In this document we aim to explain some of the key differences.

ISO 14001	ISO 50001	Difference
1.Scope	1.Scope	Specifies requirements for establishing, implementing, maintaining and improving an energy management system
3.3 Corrective Action	3.3 Correction	Correction focuses on the action to eliminate a detected nonconformity (not the cause which is covered in 3.4 see below)
3.4 Document	3.4 Corrective Action	Corrective action is to eliminate the cause of a nonconformity
3.5 Environment	3.5 Energy	ISO 50001 focuses on energy including: electricity, fuels, steam, heat, compressed air and other like media
3.6 Environmental Aspect	3.6 Energy Baseline	ISO 50001 focuses on the need to establish a baseline for comparison of energy performance

3.7 Environmental Impact	3.7 Energy Consumption	ISO 50001 focuses on the quantity of energy applied
3.8 Environmental Management System	3.8 Energy Efficiency	ISO 50001 focuses on quantitative relationship between an output of performance, service, goods or energy and an input of energy
3.9 Environmental Objective	3.9 Energy Management System	A set of interrelated or interacting elements to establish an energy policy and energy objectives as well as processes and procedures to achieve those objectives
3.10 Environmental Performance	3.10 Energy Management Team	ISO 50001 talks about the person(s) responsible for the implementation of the energy management system
3.11 Environmental Policy	3.11 Energy Objective	The energy objective is the specified outcome to meet the organisation's energy policy related to its improved energy performance
3.12 Environmental Target	3.12 Energy Performance	The measureable results related to energy efficiency (3.8) energy use (3.18) and energy consumption (3.7)
3.13 Interested Party	3.13 Energy Performance Indicator (EnPI)	Quantitative value or measure of energy performance
3.14 Internal Audit	3.14 Energy Policy	The statement by the organisation of its overall intentions and direction related to its energy performance
3.15 Nonconformity	3.15 Energy Review	Determination of the organisation's energy performance based on data leading to the identification of opportunities for improvement
3.16 Organisation	3.16 Energy Services	Activities and their results related to the provision and/or use of energy
3.17 Preventative Action	3.17 Energy Target	A detailed and quantifiable energy performance requirement arising from the energy objective (3.11)
3.18 Prevention of Pollution	3.18 Energy Use	Manner or kind of application of energy (e.g. Ventilation, lighting, heating, cooling, transportation, processes, production lines)
3.19 Procedure	3.19 Interested Party	Person or group concerned with, or affected by, the energy performance of an organisation

3.20 Record	3.20 Internal Audit	As per clause 3.14 of ISO 14001 but relating solely to energy management system
	3.21-3.28	ISO 50001 then lists remaining terms of reference with a focus solely on energy consumption management, consumption and use.
4.1 General Requirements	4.1 General Requirements	ISO 50001 focuses on energy management systems
	4.2 Management Responsibility	See ISO 14001 4.4.1 below.
4.2 Environmental Policy	4.3 Energy Policy	ISO 50001 focuses on the need for a specific policy in relation to energy which is clearly resourced, documented and reviewed, aiming to achieving energy performance improvement rather than environmental performance and prevention of pollution. It reflects the relationship between the company activities and relevant energy consumption.
4.3 Planning	4.4 Energy Planning 4.4.1 General	ISO 50001 emphasizes that an energy planning process shall be consistent with the energy policy and shall involve a review of the organisation's activities that can affect energy performance.
4.3.1 Environmental Impacts	4.4.3 Energy review 4.4.4 Energy baseline 4.4.5 Energy performance indicators	ISO 50001 gives a greater level of details of what shall be included in an energy review including a review of past, present, and expected energy consumption, concluding with an energy baseline and identification of energy performance indicators (EnPIs). The purpose of the review is to understand the areas of significant energy consumption that account for the greatest energy use or that offer the most potential for energy savings.
4.3.2 Legal and other requirements	4.4.2 Legal requirements and other requirements	ISO 50001 refers to the applicable legal and other requirements related to energy perspectives only
4.3.3 Objectives, targets and programme(s)	4.4.6 Energy objectives, energy targets and energy management action plans	Objectives, targets and management plans must be consistent with the energy policy and the significant energy uses and opportunities rather than related to all environmental aspects.
4.4 Implementation and operation	4.5 Implementation and operation	Title only.
4.4.1 Resources, roles, responsibility and authority	4.2 Management responsibility 4.2.1 Top management 4.2.2 Management representative	ISO 50001 defines clearly the corresponding responsibilities of the top management & the management representative(s) in demonstrating its commitment to support the EnMS and how the EnMS is ensured and properly established with appropriate provisions, necessary resources, etc.
4.4.2 Competence, training and awareness	4.5.2 Competence, training and awareness	No significant differences.

4.4.3 Communication	4.5.3 Communication	On top of its EnMS & energy performance, ISO 50001 allows the organisation to make its own decision whether to communicate externally about its energy policy.
4.4.4 Documentation	4.5.4 Documentation 4.5.4.1 Documentation requirements	ISO 50001 emphasizes that the degree of documentation can vary based on the unique condition of different organisations, e.g. scale, types of activities, process complexity, etc.
4.4.5 Control of documents	4.5.4.2 Control of documents	No significant differences.
4.4.6 Operational control	4.5.5 Operational control 4.5.6 Design 4.5.7 Procurement of energy services, products, equipment and energy	ISO 50001 addresses that when planning for contingency or emergency situations or potential disasters, including procuring equipment, the organisation may choose to include energy performance in determining how it will react to these situations. ISO 50001 is also more specific about setting criteria for operation and maintenance of installations, equipment and buildings and evaluation of energy consumption in design.
4.4.7 Emergency preparedness and response		Not addressed in ISO 50001
4.5 Checking	4.6 Checking	Title only
4.5.1 Monitoring and measurement	4.6.1 Monitoring, measurement and analysis	ISO 50001 is more specific in this clause stipulating a minimum requirement to be monitored, measured and analysed, which includes significant energy uses and its relevant variables and other outputs of energy review; EnPIs; effectiveness of the action plans in achieving energy objectives and targets; and evaluation of actual versus expected energy consumptions.
4.5.2 Evaluation of compliance	4.6.2 Evaluation of compliance with legal requirements and other requirements	No significant differences.
4.5.3 Nonconformity, corrective action and preventative action	4.6.4 Nonconformities, correction, corrective action and preventative action	No significant differences.
4.5.4 Control of records	4.6.5 Control of records	No significant differences.
4.5.5 Internal audit	4.6.3 Internal audit of the EnMS	ISO 50001 strengthens the requirement for the verification of actions taken (i.e. the established energy objectives & targets; and the improved energy performance); and reporting of the verification results.
4.6 Management review	4.7 Management review 4.7.1 General 4.7.2 Input to management review 4.7.3 Output from management review	ISO 50001 focuses on the EnMS, energy performance and related EnPIs

So, in conclusion, the main benefits of ISO 50001 are the following:

- Works from large to small organisations across diverse commercial, industrial and public sectors
- Cost savings
- Increased assurance of legal, internal compliance
- Helps to achieve energy efficiency
- Reduced environmental impact – carbon and GHG
- Coordinating energy programs (Energy Efficiency, Energy Production, Renewable Energy and Alternative Energy)
- Builds energy management into business practices
- Increased knowledge of equipment efficiencies. Through integration you can align your Energy Management System (EnMS) with existing management systems for additional organisational benefits.
- Improves operations and capital cost decisions
- Facilitates energy management best practices
- Improves the ability to benchmark, measure and report energy intensity improvements
- Improves transparency and communication on the management of energy resources
- Helps in the evaluation and prioritisation of new energy-efficient technologies
- Framework for promoting energy efficiency throughout the supply chain

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References

General References

- AA.VV. (2007), *Harvard Business Review on Green Business Strategy*, HBS Press, Harvard.
- AA.VV. (2007), *Responsabilidad Social Corporativa*, ACCID, Barcelona.
- AA.VV. (2010), Anno VIII, Numero 6, Edizioni AIAB.
- Aaker D. (2011), *Brand Relevance*, Franco Angeli, Milano.
- AA.VV. (2010), *Schüco Italia Headquarters. Architettura, sostenibilità, benessere*, The Plan Editions Bologna.
- Aaker D.A. (2011), *Strategic Market Management*, (6th Edition), Chapter 3, John Wiley And Sons Inc.
- Adams D.C., Briggeman B.C., Lusk J.L., Toler S. (2009), *Fairness, Farmers Markets, and Local Production*, in «American Journal of Agricultural Economics», n. 9.
- Agamben G. (1995), *Homo Sacer. Il potere sovrano e la nuda vita*, Einaudi, Torino.
- Agnoletto M., Delpiano A., Guerzoni M. (curated by), 2007, *La civiltà dei superluoghi. Notizie dalla metropoli contemporanea*, Damiani, Bologna.
- Albareda Vivó L., Balaguer Franch M.R. (2007), "La responsabilidad social de la empresa y los resultados financieros", in AA.VV., ACCID, Barcelona, pp. 11-26.
- Alberti F., Sciascia S. (2004), *Le politiche di marchio per i distretti industriali: i casi di Como e Biella*, in «Liuc Papers» n. 147, Serie Piccola e Media Impresa 11, Suppl. april.
- Ambec S., Cohe, M. A., Elgie S., Lanoie, P., 2013, The Porter Hypothesis at 20: Can environmental regulation enhance innovation and competitiveness? In: "Review of Environmental Economics and Policy" 7 (1)
- Ambec S., Johnstone N., Lanoie P., Laurent-Lucchetti J. (2007), *Environmental Policy, Innovation and Performance: New Insights on the Porter Hypothesis*, Working Paper GAEL, n. 07, Laboratoire d'Economie Appliquée de Grenoble, June.
- Amendola G. (2008), *La città postmoderna. Magie e paure della metropoli contemporanea*, Editori Laterza, Roma.
- Antaloudaki K. (2007), *Social responsibility of business in Greece*, Unpublished Phd. Thesis.
- Appadurai A. (2001), *Modernità in polvere*, Meltemi, Roma.
- Arimura T., Hibiki A., Johnstone N. (2007), "An empirical study of environmental R&D: what encourages facilities to be environmentally-innovative?", in N. Johnstone (ed.), Cheltenham UK, Edward Elgar in association with OECD.
- Ashworth G.J., Graham B. (2005), "Senses of Place, Senses of Time and Heritage", in G.J. Ashworth, B. Graham (ed.s), Ashgate, London.
- Ashworth G.J., Graham B. (ed.s), *Senses of Place: Senses of Time*, Ashgate, London.
- Ashworth G.J., Voogd H. (1995) *Selling the City Marketing Approaches in Public Sector Urban Planning*, Wiley&Sons, Chichester.
- Aubert-Gamet V., Cova B. (1999), *Servicescape: From Modern Non-Places to Postmodern Common Places*, in «Journal of Business Research», n. 44.
- Augé M. (1992), *Disneyland e altri nonluoghi*, Torino, Bollati Boringhieri.
- Augé M. (1999), *Nonluoghi. Introduzione a una antropologia della surmodernità*, Elèuthera, Milano.
- Auricoste I. (1991), *Parchi o utopie mortali? La posta in gioco del tempo libero*, in «Ottagono», n. 99.

- Ausubel J.H., Sladovich H.E. (curated by) (1989), *Technology and environment*, National Academy Press, Washington DC.
- Avlonitis G. (2011), *Green marketing, stands, attitude and perception of Greek Consumer Behavior*, Department of Marketing and Communication, Athens University of Economics.
- Avlonitis J.I. (2010), *Green Marketing: Attitudes, Perceptions and Behavior of Greek Consumers*, Department of Marketing and Communication, Athens University of Economics.
- Ayres R.U., Simonis U.E. (curated by) (1994), *Industrial metabolism*, Tokyo, United Nations University Press.
- Baden J.A. (1992), *Business, Science and Environmental Politics: Towards a Political Economy of Hope*, in «Columbia Journal of World Business», Vol. 27.
- Bajo Sanjuán A., Villagra García N. (eds.), *La ética empresarial y la responsabilidad social en el nuevo contexto digital*, Universidad Pontifica Comillas, Madrid.
- Baldo G.L., Marino M., Rossi S. (2008), *Analisi del ciclo di vita LCA. Gli strumenti per la progettazione sostenibile di materiali, prodotti e processi*, Edizioni Ambiente, Milano.
- Barnes P. (2007), *Capitalismo 3.0. Il pianeta patrimonio di tutti*, Egea, Milano.
- Barnett C., Cloke P., Clarke N., Malpass A. (2011), *Globalizing Responsibility. The political Rationalities of Ethical Consumption*, Wiley-Blackwell, London.
- Bartolini S. (2010), *Manifesto per la felicità*, Donzelli, Roma.
- Baudrillard J. (1980), *Della seduzione*, Bologna, Cappelli.
- Baudrillard J. (1976), *La società dei consumi*, Il Mulino, Bologna.
- Baudrillard J. (1991), *La trasparenza del male: saggio sui fenomeni estremi*, SugarCo, Milano.
- Bauman Z. (2007), *Homo consumens*, Erickson, Trento.
- Bauman Z. (2008), *Modernità liquida*, Editori Laterza, Roma-Bari.
- Bäverstam O., Larsson M. (2009), *Strategic green marketing: a comparative study of how green marketing affects corporate strategy within business to Business* (available at <https://pure.ltu.se/ws/files/31131504/LTU-CUPP-09123-SE.pdf>)
- Becattini G. (1999), *Il distretto industriale*, Rosenberg & Sellier, Torino.
- Becchetti L. (2005), *Felicità sostenibile. Economia della responsabilità sociale*, Donzelli Editore, Roma.
- Becchetti L. (2009), *Oltre l'homo oeconomicus*, Città Nuova, Roma.
- Bechtel R.B., Churchman A. (eds.), (2002), *Handbook of Environmental Psychology*, Wiley, New York.
- Beck U. (2000), *La società del rischio*, Carrocci, Roma.
- Beck U. (2008), *Conditio humana. Il rischio nell'età globale*, Laterza, Bari Roma.
- Beck U. (2009), *Che cos'è la globalizzazione*, Carocci, Roma.
- Beck U., Giddens A., Lash S. (1999), *Modernizzazione riflessiva*, Asterios Editore, Trieste. elch G.E., Belch M.A. (2001), *Advertising and Promotion – An Integrated Marketing. Communications Perspective*, McGraw-Hill/Irwin.
- Bellini N. (2004), *Territorial governance and place image*, in "Symphonia", n.1.
- Bellini N., Cortesi G., Lazzeroni M., Loffredo A. (2011), *L'approccio territoriale alla cultural economy: nuove idee per la valorizzazione dei centri minori* (in corso di pubblicazione).
- Benavides Delgado J. (2010): "¿Cómo afecta Internet al debate sobre la Responsabilidad Social?", en Bajo Sanjuán A., Villagra García N. (eds.), Universidad Pontifica Comillas, Madrid.
- Bermejo Berros J. (2008), "El receptor publicitario del siglo XXI en el marco de la interactividad: entre el consumer y el prosumer", en Pacheco Rueda, M. (co.). *La publicidad en el contexto digital*. Sevilla: Comunicación Social, pp. 49-78
- Biasi D. (2002), *I santuari dell'automobile: Autostadt, Wolfsburg e gläserne Manufaktur*, Dresda/Henn Architekten Ingenieure, «Crossing», n. 4.

- Binder C.R. (2009), "Product chain management and social sciences: path dependency, cultural validity and short- and long-term feedback loops", in F. Boons (curated by), J. Howard-Grenville, Edward Elgar, Glos (UK).
- Bitner M.J. (1992), *Servicescape: The Impact of Physical Surroundings on Customers and Employees*, in «Journal of Marketing», Vol. 56, April 1992.
- Boccia Artieri G. (2012), *Stati di connessione. Pubblici, cittadini e consumatori nella (Social) Network Society*, Franco Angeli, Milano.
- Boglione C. (2000), *Tate Modern: dettagli nel vuoto*, in «Casabella», n. 691.
- Boglione C. (2005), *Il palcoscenico meccanico della merce*, in «Casabella», n. 732
- Bollini G., Borsari L., Stacchini V. (2007), *Insedimenti industriali e sostenibilità. Linee guida per la realizzazione di Aree Produttive Ecologicamente Attrezzate*, Alinea, Firenze.
- Bonaiuto M., Bilotta E., Fornara F. (2004), *Che cos'è la psicologia architettonica*, Roma, Carocci.
- Bonazzi F. (1997), *Tra tamponamento delle emergenze e miglioramento continuo: capi UTE e tecnologie nella Fabbrica Integrata*, in «Quaderni di Sociologia», n. 15.
- Bonazzi G. (2002), *Storia del pensiero organizzativo*, Franco Angeli, Milano.
- Boons F., Howard-Grenville J. (curated by) (2009), *The social embeddedness of industrial ecology*, Edward Elgar, Glos (UK).
- Bord Bia (2010), *Consumer Attitudes to Local Food*, Qualitative Research.
- Bordieu P. (2005), *Il senso pratico*, Armando Editore, Roma.
- Borghesi S., 2011, The European emission trading scheme and renewable energy policies: credible targets for incredible results? In: "International Journal of Sustainable Economy", 3 (3)
- Bottinelli F. (2006), *Nuova sede e immagine per Vodafone Italia*, in «Ufficio Stile», n. 4.
- Bourke L. (2011), *Market Potential for Organic Food and Irish Consumer Expectations*, presentato al Bord Bia Irish Food Board.
- Bradley N. (2007), *The Green Marketing Mix*, University of Westminster, in <http://www.wmin.ac.uk/marketingresearch/Marketing/greenmix.htm>
- Bresso M., 1993, *Per un'economia ecologica*, Rome
- Bucci F. (2007), *L'era della macchina*, in «Casabella», n. 748.
- Calboli I. (2006), *Expanding the Protection of Geographical Indications of Origin under TRIPS: Old Debate or New Opportunity?*, «Marquette Intellectual Property Law Review», Vol. 10, p. 181.
- California Sustainability Alliance (2012), *Green Tenant Guide*, available at: <http://sustainca.org/>
- Campbell C. (2007), *The easternization of the West: a thematic account of cultural change in the modern era*, Paradigm Publishers, London.
- Canigiani F. (2011), *Ragionando su paesaggio/territorio/ambiente*, Working paper.
- Cariani R. (curated by) (2010), *Ecodistretti 2009. Made green in Italy: le politiche ambientali dei sistemi produttivi locali e dei distretti industriali*, Franco Angeli. Milano.
- Cariani R., Cavallo M. (2009), *Produzione ecologica e consumo responsabile*, Franco Angeli, Milano.
- Carlsson-Kanyama A. (2012), <http://www.svid.se/sustainabilityguide/Inspiration/Inspiring-people/Annica-Carlsson-Kanyama/>
- Carlsson-Kanyama A., Pipping Ekström M., Shanahan H. (2003), "Food and life cycle en-ergy inputs: consequences of diet and ways to increase efficiency", in «Ecological Economics», Volume 44, Issues 2–3, march, pp. 293-307.
- Carmagnola F. (1997), *L'estetica*, in G. Costa, R. Nacamulli (curated by), Utet, Milano.
- Carmagnola F. (2006), *Il consumo delle immagini. Estetica e beni simbolici nella fiction economy*, Paravia Bruno Mondadori, Milano.

- Carmagnola F., Ferraresi M. (1999), *Merci di culto. Ipermerce e società mediale*, Castelvevchi, Roma.
- Carnimeo G., Frey M., Iraldo F. (2002), *Gestione del prodotto e sostenibilità*, Franco Angeli, Milano.
- Caroli M. (2011), *Il marketing territoriale: idee ed esperienze nelle regioni italiane*, Franco Angeli, Milano.
- Casavant T., LeBreton W. (2005), *Sustainable industries performance indicators framework*, Vancouver, *Eco-Industrial Solutions*, available at:
http://www.ecoindustrial.ca/usgbc_toolkit/SustainableIndustryIndicatorsFinalReport23Mar05_protected.pdf
 (ultimo accesso 15 march 2012).
- Castelló Martínez A. (2010a), *Estrategias empresariales en la Web 2.0. Las redes sociales online*, Editorial ECU, Alicante.
- Castelló Martínez A. (2010b), *La sensibilización mediaambiental en redes sociales online*, «Fisec-Estrategias», n° 13, junio, pp. 23-46, www.cienciared.com.ar/ra/doc.php?n=1261 (ultimo accesso 15 march 2011).
- Castells M. (2002), *La nascita della società in rete*, Università Bocconi Editore, Milano.
- Castells M. (2002), *L'età dell'informazione: economia, società, cultura*, Egea UBE, Milano.
- Cavallo M. (curated by) (2008), *La responsabilità sociale nelle imprese. Scenari, analisi e casi di studio*, Editrice Compositori, Bologna.
- Cavallo M., Melchiorre V., Stacchini V., Nemec F. (2012), *Benchmarking aree industriali sostenibili*, "Progetto Ecomark", Bologna.
- Cavallo M., Melchiorre, Stacchini V. (2011), *Uno studio di benchmarking sulle aree produttive finalizzato a costruire piani di ecomarketing territoriale a livello europeo*, in M. Morselli (curated by), mayli, Rimini.
- Cavallo M., Stacchini V. (curated by) (2007), *La qualificazione degli insediamenti industriali. Verso la costruzione di aree produttive ecologicamente attrezzate*, Clueb, Bologna.
- Cercola R. (1999), *Economia Neoindustriale e Marketing Territoriale*, in «Sviluppo e Organizzazione», 172, pp. 65-78.
- Chertow M.R. (2003), *Evaluating the success of eco-industrial development*, in E.
- Cohen-Rosenthal, J. Musnikow (curated by), Greenleaf, Sheffield.
- Choay F. (1995), *L'allegoria del patrimonio*, Officina, Roma.
- Christaller W. (1980), *Le località centrali della Germania meridionale*, Franco Angeli, Milano.
- Cianciullo A., Silvestrini G. (2010), *La corsa della green economy. Come la rivoluzione verde sta cambiando il mondo*, Edizioni Ambiente, Milano.
- Cietta E. (2007), *Gli spazi, il contesto e le relazioni in cui si genera innovazione*, documento di studio per il convegno "Ufficio Fabbrica Creativa", Milano, 29 may.
- Cietta E. (2010), *Sintesi dei primi risultati della ricerca Ufficio Fabbrica Creativa* di Assoufficio.
- Codeluppi V. (2000), *Lo spettacolo della merce*, Bompiani, Milano.
- Codeluppi V. (2001), *Il potere della marca*, Bollati Boringhieri, Torino.
- Codeluppi V. (2010), *Dalla produzione al consumo. Processi di cambiamento delle società contemporanee*, Franco Angeli, Milano.
- Codeluppi V., Paltrinieri R. (curated by) (2007), *Il consumo come produzione*, Franco Angeli, Milano.
- Cohen-Rosenthal E., Musnikow J. (curated by) (2003), *Eco-industrial strategies: unleashing synergy between economic development and the environment*, Greenleaf, Sheffield.
- Collesei U. (1989), *Marketing*, Cedam, Padova.
- Commissione Europea, *Libro Verde*, presentato il 18 July 2001, Bruxelles.
- Committeri M. (2004), *Investire in Italia ? risultati di una recente indagine empirica*, Banca d'Italia – Temi di discussione del servizio studi, n. 491.

- Conticelli E., Tondelli S., (2009), *La pianificazione delle aree produttive per lo sviluppo sostenibile del territorio*, Alinea, Firenze
- Cooke P.N. (1983), *Theories of planning and spatial development*, Hutchinson, London.
- Corbellini G. (2000), *Dal volume all'interfaccia. La prevalenza della superficie nell'architettura contemporanea*, in «ArchInt. Architettura Intersezioni», n. 8.
- Corecom (2009), *Gli amministratori locali e la comunicazione istituzionale. Informazione e partecipazione dei cittadini nell'era internet*, Mcs Press, Trieste.
- Costa G., Nacamulli R. (curated by) (1997), *Manuale di organizzazione aziendale*, Vol. 2, La progettazione organizzativa, UTET, Milano.
- Cova B. (2003), *Il marketing tribale. Legame, comunità, autenticità come valori del marketing*, Il Sole 24 Ore, Milano.
- Cova B., Giordano A., Pallera M. (2008), *Marketing non-convenzionale*, Il Sole 24 Ore, Milano.
- Cox E., Ryan-Collins J., Squires P., Potts R. (2010), *Re-imagining the high street. Escape from Clone Town Britain*, New Economics Foundation, London.
- Cozzi G. (1974), *Appunti dalle lezioni di tecnica delle ricerche di mercato e della distribuzione generale*, Itec, Genova.
- Darby K., Batte M.T., Ernst S., Roe B. (2008), *Decomposing Local: A Conjoint Analysis of Locally Produced Foods*, in «American Journal of Agricultural Economics», n. 90, pp. 476-486.
- Davidow W.H., Malone M.S. (1995), *L'azienda virtuale*, Sperling & Kupfer, Milano.
- De Groot R.S., Wilson M.A., Boumans R.M.J. (2002), *A typology for the classification, description and valuation of ecosystem functions, goods and services*, in «Ecological Economics» 41, pp. 393-408.
- De la Rosa Leal M.E. (2007), "La gestión medioambiental como una expresión de la responsabilidad social en la industria maquiladora de Hermosillo", Sonora, México in AA VV, ACCID, Barcelona, pp. 185-204.
- De Salas Nestares M.I. (2010), "La estrategia de comunicación basada en valores ecológicos como instrumento de la RSC", in V. Ros Diego (curated by), Dykinson, Madrid, pp. 15-32.
- De Vico D. (2012), *Turno in fabbrica dalle 5 del mattino Alla Luxottica i lavoratori dicono sì*, in «Corriere della Sera», 12th of January. website: http://www.corriere.it/economia/12_gennaio_15/turno-fabbrica-divico_bcc776ce-3f55-11e1-8779-a112fb36ee96.shtml
- Degli Esposti P. (2004), *Il cibo dalla modernità alla postmodernità*, Franco Angeli, Milano.
- Deutz P., Gibbs D. (2008), "Industrial ecology and regional development: ecoindustrial development as cluster policy", in «Regional Studies», 42 (10).
- Devens Enterprise Commission (2005), *EcoStar action guide*: available at: <http://www.ecostardevens.com/EcoStar%20Action%20Guide%20small.pdf>
- DeWeerd S. (2011), *Is Local Food Better?*, available at: <http://www.worldwatch.org/node/6064> (accesso effettuato il 30.1.12)
- Di Nallo E. (1984), *Razionalità, simulazione, consumo*, in «Sociologia della Comunicazione N.6, Franco Angeli, Milano.
- Di Nallo E. (1998), *Quale marketing per la società complessa?*, Franco Angeli, Milano.
- Di Nallo E., Fabris G. (curated by) (2004), *L'esperienza del tempo di consumo tra pratiche e fruizione sociale*, Franco Angeli, Milano.
- Di Nallo E., Paltrinieri R. (curated by) (2006), *Cum Sumo. Prospettive di analisi del consumo nella società globale*, Franco Angeli, Milano.
- Di Nicola P. (2007), *Amichevolmente parlando. La costruzione di relazioni sociali in una società di legami deboli*, Franco Angeli, Milano

- Di Nicola P., Stanzani S., Tronca L. (2008), *Reti di prossimità e capitale sociale in Italia*, Franco Angeli, Milano.
- Donati P. (curated by) (2006), *Sociologia – Una introduzione allo studio della società*, Cedam, Padova.
- Donati U. (2011), *L'origine del pensiero ecologico*, in «Editoriale Bio», Edizioni Edizioni Agone, Brescia.
- Douglas M. (1984), *Il mondo delle cose. Oggetti, valori, consumo*, il Mulino, Bologna.
- Douglas M. (1999), *Questioni di gusto*, il Mulino, Bologna.
- Dracou Ch. (2012), *Green Marketing in the Greek clothing Industry*, pubblicazione tesi dottorato.
- Duesenberry J.S. (1969), *Reddito, risparmio e teoria del comportamento del consumatore*, Etas Kompass, Milano.
- EcoStar Program overview*, available at: <http://www.ecostardevens.com/indexfiles/Page8208.htm> (ultimo accesso 15 march 2012).
- Enteleca (2000), *Tourist Attitudes towards Regional and Local Foods Report*, preparato per MAFF e Countryside Agency, Enteleca Research and Consultancy Ltd, London.
- Enteleca (2000), *Tourist Attitudes towards Regional and Local Foods Report*, preparato per MAFF e Countryside Agency, Enteleca Research and Consultancy Ltd, London.
- Environment Agency – Netregs (2003), *SMEEnvironment, a survey to assess environmental behaviours among smaller UK businesses*.
- Environment Park/Dossier 4 (2000), *Gestione ambientale delle aree industriali, Edizione italiana su licenza UNEP*, Cuneo.
- Esty D.C., Winston A.S. (2009), *Green to Gold. How smart companies use environmental strategy to innovate, create value, and build competitive advantage*, John Wiley & Sons Editore, New Jersey.
- European Commission (2007), *Small, clean and competitive: a program to help small and medium-sized enterprises comply with environmental legislation*, Impact Assessment.
- European Environment Agency (1997), *Environmental Management Tools for SMEs: A Handbook*, edited for the EEA by R. Starkey. The Centre for Corporate KPMG, "The Environmental Challenge and Small and Medium Sized Enterprises in Europe" (The Hague: KPMG Consulting).
- Evans J. (2004), *What is local about local environmental governance? Observations from the local biodiversity action planning process*, in «Area», 36.3, pp. 270–279.
- Fabris G. (2009), *Il nuovo consumatore verso il posto moderno*, Franco Angeli, Milano.
- Fabris G. (2010), *La società post-crescita. Consumi e stili di vita*, Egea, Milano.
- Fabris G.P. (2008), *Societing. Il marketing nella società postmoderna*, Milano, Egea.
- Fang Y., Côté R.P., Qin R. (2007), *Industrial sustainability in China: practice and prospects for eco-industrial development*, in «Journal of Environmental Management», 83.
- Featherstone M. (1994), *Cultura del consumo e postmodernismo*, Seam, Roma.
- Fernández I., Ruiz M.C. (2009), *Descriptive model and evaluation system to locate sustainable industrial areas*, in «Journal of Cleaner Production», 17.
- Ferrell O.G., George H.L., Luck D. (1991), *Strategic Marketing Management*, Southwestern Publishing Co., Cincinnati, Ohio.
- Ferrera M., Maino F. (2011), *Il secondo welfare in Italia: sfide e prospettive*, in «Italianieuropei», 3.
- Ferrucci F. (2010), *Capitale sociale e partnership tra pubblico, privato e terzo settore*, Franco Angeli, Milano.
- Fiorenza O., Roj M. (curated by) (2000), *Workspace/Workspace. I nuovi scenari dell'ufficio*, Skira, Milano.
- Florida R. (2005), *Cities and the Creative Class*, Routledge, London.
- Foglio A. (2008), *Il marketing ecologico. Crescere nel mercato tutelando l'ambiente*, Franco Angeli, Milano.
- Foucault M. (1986), *Spazi altri. I principi dell'eterotopia*, in «Lotus International».
- Franchi M., Schianchi A. (2012), *Scegliere al tempo di Facebook*, Carocci, Roma.

- Franco M. (2005), *I parchi eco-industriali. Verso una simbiosi tra architettura, produzione e ambiente*, Franco Angeli, Milano.
- Friedman T.L. (2006), *Il mondo è piatto. Breve storia del ventesimo secolo*, Mondadori, Milano.
- Frosch R.A., Gallopoulos N.E. (1989), *Strategies for manufacturing*, in «Scientific American», 266.
- Fuchs C. (2001), *Foundations of Critical Media and Information Studies*, Routledge, London.
- Füglister U., Pleitner H.J., Volery T., W. Weber (eds.) (2002), *Radical Changes in the World: Will SMEs Soar or Crash?*, St Gallen, Switzerland, Rencontres de St Gallen), pp. 525-34.
- Fuller A.D. (1999), *Sustainable marketing: Managerial-ecological issues*, Sage Publications, Inc., London.
- Garnett T. (2008), *Cooking up a storm. Food, greenhouse gas emissions and our changing climate*, Food Climate Research Network, Centre for Environmental Strategy, University of Surrey.
- Geng Y., Zhang P., Côté R. P., Qi Y. (2008a), *Evaluating the applicability of the Chinese eco-industrial park standard in two industrial zones*, in «International Journal of Sustainable Development and World Ecology», 15 (6).
- Geng Y., Zhang P., Côté R.P., Fujita T. (2008b), *Assessment of the national ecoindustrial park standard for promoting industrial symbiosis in China*, in «Journal of Industrial Ecology», 13 (1).
- Georgescu Roegen N. (1998), *Energia e miti economici*, Torino, Bollati Boringhieri.
- Gibbs D. (2009), *Eco-industrial parks and industrial ecology: strategic niche or mainstream development?*, in F. Boons, Howard-Grenville J. (curated by), Edward Elgar, Glos (UK).
- Gibbs D., Deutz P. (2007), *Reflection on implementing industrial ecology through eco-industrial park development*, in «Journal of Cleaner Production».
- Gibelli M.C., Salzano E. (curated by) (2006), *No sprawl: perché è necessario controllare la dispersione urbana e il consumo di suolo*, Alinea, Firenze.
- Giddens A. (2012), <http://www.cambridgewordfest.co.uk/festivals/spring/authors/view/302>
- Ginsberg M.J., Bloom P.N. (2004), *Choosing the Right Green Marketing Strategy*, in «MIT Sloan Management Review».
- Giordano A., Pallera M., (2009), "Per un'ecologia del brand", in J. Grant, Brioschi, Milano.
- Giraud G., Halawany R. (2006), *Consumers' perceptions of food traceability in Europe*, paper presentato al seminario EAAE, Chania 29 June - 2 July.
- Giuntini R., Andel T. (2001), *Advance with reverse logistics: Part 2*, «Transportation and Distribution», 36 (3).
- Giupponi C., Galassi S., Pettenella D. (curated by), 2009, *Definizione del metodo per la classificazione e quantificazione dei servizi ecosistemici in Italia. Verso una strategia nazionale per la biodiversità: i contributi della conservazione ecoregionale*, Ministero dell'Ambiente e della Tutela del Territorio e del Mare.
- Gobbi L., Morace F. (2009), *Il gioiello nei nuovi scenari del lusso: creatività, brand, comunicazione*, rapporto di ricerca presentato nell'ambito di VicenzaOro First, Vicenza, 11st of January.
- Graedel T.E., Allenby B.R. (2010), *Industrial ecology and sustainable engineering*, Upper Saddle River, Pearson.
- Grant J. (2009), *Green Marketing. Il Manifesto*, Francesco Brioschi Editore, Milano.
- Greenwashing guide*, http://www.futerra.co.uk/downloads/Greenwash_Guide.pdf
- Guidicini P. (1998), *Nuovo manuale per le ricerche sociali sul territorio*, Franco Angeli, Milano.
- Gunnigham N. (2003), *Regulating Small and Medium Sized Enterprises*, in «Journal of Environmental Law», Vol 14, No. 1., p. 3.
- Günther F. (1993), *Phosphorus flux and societal structure. In: A Holistic Approach To Water Quality Management Finding Life-Styles and Measures for Minimizing Harmful Fluxes from Land To Water*, Stockholm Water Symposium 10-14 August 1992 Stoccolma Svezia, Pubblicazione no.2. Stockholm Water Co., pp. 267-298.
- Gunther M. (2006), *Wall Mart "The Green Machine"*, «Fortune magazine», 31 July.
- Gunther M. (2007a), *Compassionate Capitalism at Timberland*, in «Fortune Magazine».

- Gunther M. (2007b), *Green Is Good*, in «Fortune Magazine».
- Hambleton R. (1990), *Urban governments in the 1990s: lessons from the USA* Occasional Paper n. 35, School of Advanced Urban Studies, Bristol.
- Hardt M., Negri A. (2002), *Impero. Il nuovo ordine della globalizzazione*, Rizzoli, Milano.
- Harvey D. (1989), *The urban experience*, Blackwell, Oxford.
- Harvey D. (2002), *La crisi della modernità*, Net, Milano.
- Hatzinikolaou N. (2009), "The developments and the prospects of Green Marketing on Greek and foreign companies", published Phd. Survey, University of Macedonia, Department of Economical and Social Sciences.
- Hertz N. (2003), *La conquista silenziosa*, Carocci, Roma
- Hewes A.K., Lyons D.Y. (2008), *The humanistic side of eco-industrial parks: champions and the role of trust*, in «Regional Studies», 42 (10).
- Hillary R. (1999), "Evaluation of Study Reports on the Barriers, Opportunities and Drivers for Small and Medium-sized Enterprises in the Adoption of Environmental Management Systems", Department of Trade and Industry, London.
- Hinrichs C., Allen P. (2008), *Selective Patronage and Social Justice: Local Food Consumer Campaigns in Historical Context*, «in Journal of Agriculture and Environmental Ethics».
- Holliday C. (2001), "Sustainable Growth, the DuPont Way," Harvard Business Review, September, pp. 130-134.
- Hong S., Wyer R.S. (1989), *Effects of country of origin and product-attribute information on product evaluation: an information processing perspective*, in «Journal of Consumer Research», 16.
- Hospers G.J. (2004), *Place Marketing in Europe: The Branding of the Oresund Region*, «Intereconomics: Review of European Economic Policy», 39 (5), pp. 271-279.
- Huang J. (2001), *A new blueprint for business architecture*, in «Harvard Business Review», April.
- IGD (2002), *Consumer Attitudes to Food and Grocery Issues – Local and Regional Foods*, IGD Business Publications, Letchmore Heath, Watford, Herts, march.
- Iraldo F. (2002), *Ambiente, Impresa e Distretti industriali. Gestione delle relazioni interorganizzative e ruolo degli stakeholder*, Franco Angeli, Milano.
- Ito T. (1998), *L'immagine dell'architettura nell'era dell'elettronica*, in «Domus», n. 800.
- Jackson P. (2004), "Local consumption cultures in a globalizing world" Transactions of the Institute of British Geographers (29) 2, pp. 165-178.
- Jackson T. (2007), *Mainstreaming sustainability in local economy development practice*, in «Local Economy», 22 (1).
- Jackson T. (2011), *Prosperità senza crescita. Economia per il pianeta reale*, Edizioni Ambiente, Bologna.
- Jain S.C. (2000), *Marketing Planning and Strategy*, 6th edition, South-Western, Ch 6-7.
- Jáuregui R. (2009), *Reputación corporativa, RSC, sostenibilidad, acción social. ¿De qué hablamos?*, Telos, nº 79, junio, pp. 66-74.
- <http://sociedadinformacion.fundacion.telefonica.com/telos/cuadernograbar.asp?idarticulo=2&rev=79.htm>
Fecha de consulta: 11/03/2011.
- Jenkins H. (2007), *Cultura convergente*, Apogeo, Milano.
- Jenkins H. (2012) <http://www.triennale.it/it/calendario/calendario-eventi-list/1115-media-city-new-spaces-new-aesthetics>
- Johnstone N. (ed.), *Corporate Behaviour and Environmental Policy*, Cheltenham UK, Edward Elgar in association with OECD.
- Jose P.P. (2010), «Corporate Strategies and the Environment: A Portfolio Approach" Long Range Planning, April, pp. 462 – 472.

- Kolstad C., 2000, *Environmental Economics*, Oxford University Press, New York
- Kontic I., Biljeskovic J. (2010), "Greening the marketing mix : A case study of the Rock-wool Group", University essay from Höskolan i Jönköping/IHH, EMM.
- Kotler P. (1986), *Marketing management 1*, ISEDI, Torino.
- Kotler P. (2008a), *I 10 peccati capitali del marketing*, Il Sole 24 Ore, Milano.
- Kotler P. (2008b), *Il marketing dalla A alla Z*, Il Sole 24 Ore, Milano.
- Kotler P., Haider D.H., Rein I. (1993), *Marketing Places*, Free Press, New York.
- Kotler P., Lee N. (2008), *Marketing e Responsabilità Sociale d'Impresa*, Il Sole 24 Ore, Milano.
- Kotler P., Pfoertsch W. (2008), *La gestione del brand nel B2B*, Tecniche Nuove, Milano.
- Krugman P. (1996), *A country is not a company*, in «Harvard Business Review», January-February.
- Kurup B., Stehlik D. (2009), *Towards a model to assess the sustainability implications of industrial symbiosis in eco-industrial parks*, in «Progress in Industrial Ecology», 6 (2).
- La Cecla F. (2008), *Contro l'architettura*, Bollati Boringhieri, Torino.
- La Rosa M., Morri L. (curated by) (2005), *Etica economica e sociale*, Franco Angeli, Milano.
- Lall S. (2001), *Competitiveness Indices and developing countries: an economic evaluation of the global competitiveness*, Report in "World Development", 29 (9) pp. 1501 – 1525.
- Lamas C. (2010): *Los medios interactivos y su publicidad. La medición de audiencias*, in «Telos», nº 82, february, pp. 95-101, to http://sociedadinformacion.fundacion.telefonica.com/DYC/TELOS/SOBRETELOS/Numerosanteriores/DetalleAnteriores_82TELOS_DOSSIERPV1/seccion=1268&idioma=es_ES&id=2010020409130001&activo=6.do ultima data di consultazione: 17 june 2011.
- Latouche S. (2001), *Per un'abbondanza frugale: Malintesi e controversie sulla decrescita*, Bollati Boringhieri, Milano.
- Latouche S. (2007), *La scommessa della decrescita*, Feltrinelli, Milano.
- Lave J., Wenger E. (2006), *L'apprendimento situato: dall'osservazione alla parteci-pazione attiva nei contesti sociali*, Erickson, Gardolo.
- Layte R., Harrington J., Sexton E., Perry I.J., Cullinan J., Lyons S. (2011), *Irish Exceptionalism? Local Food Environments and Dietary*, in «Quality Journal Epidemiology and Community Health», 65 (10), pp. 881-888.
- Le Goff J. (2007), *Il meraviglioso e il quotidiano nell'Occidente medievale*, Editori Laterza, Roma.
- Leopold Centre (2011), *Local foods in Iowa: Increased opportunities for economic growth*, Leopold Centre Factsheet January 2011: <http://www.leopold.iastate.edu/pubs/nwl/2008/2008-4leoletter.pdf?page=1&topic=All>
- Lessig L. (2009), *Remix. Il futuro del copyright (e delle nuove generazioni)*, Etas, Milano.
- Levi-Strauss C. (1983), *Le regard éloigné*, Plon, Paris.
- Levitt T. (1983), *The Globalization of Markets*, «Harvard Business Review», may/ june, pp. 92-102.
- Levy P. (1998), *L'intelligenza collettiva. Per un'antropologia del cyberspazio*, Feltrinelli, Milano.
- Lombardi M. (2000), "Passare dalla soap opera alla brand.com", in Id. (curated by), Franco Angeli, Milano.
- Lombardi M. (curated by) (2000), *Il dolce tuono*, Franco Angeli, Milano.
- Lord M. (1998), "Economic instruments and the business use of energy, Marshall Report, Stationary office, London.
- Losch A. (1954), *The economics of location*, Yale university Press, New Haven.
- Lowe E. (2010), *Eco-Industrial park handbook for Asian developing countries, USA, Indigo Development*, available at: <http://www.indigodev.com/ADBHBdownloads.html> (ultimo accesso 15.march 2012).

- Lowe E., Moran S., Holmes D. (1996), *A Fieldbook for the Development of Ecoindustrial Parks*, Final Report, N.C., Research Triangle Institute.
- Lowitt P.C. (2008), *Devens redevelopment*, in «Journal of Industrial Ecology», 12 (4).
- Lowitt P.C. (2012), *Comunicazione personale*, 14 march.
- Luckey J. (2009), *The Buy American Act: Requiring Goverment Procurements to Come from Domestic Sources*, Congressional Research Service.
- Luhmann N. (1990), *Sistemi sociali*, il Mulino, Bologna.
- Lusk J.L., Briggeman B. (2009), *Food Values*, in «American Journal of Agricultural Economics», Vol. 91, No. 1, pp. 184-196.
- Lyotard J.F. (1981), *La condizione postmoderna. Rapporto sul sapere*, Feltrinelli, Milano.
- Mackintosh C. (2009), *Food Miles, or 'Fair Miles' Consumerism, Food Shortages, Global Warming/Climate Change, Society*, 21 june 2009 accesso all'indirizzo <http://permaculture.org.au/2009/01/21/food-miles-or-fair-miles/>
- Madinabeitia E. (2010), *La publicidad en medios interactivos. En busca de nuevas estrategias*, in «Telos», n° 82, february, pp. 43-54.
- Maffesoli M. (2009), *Il tempo delle tribù*, Edizioni Angelo Guerini, Milano.
- Magnaghi A. (2000), *Il progetto locale*, Bollati Boringhieri, Torino.
- Maione G. (2003), *La politica estera americana da Nixon a Reagan*, Edizioni Baiesi, Bologna.
- Maira M.M. (2009), *¿Qué es responsabilidad social empresarial?*, «Revista i&m Investigación y Marketing», n. 104, september, AEDEMO, pp. 36-50.
- Malmberg A. (2003), *Remaking the Global Economy*, Sage, London.
- Mandaraka M., Georgakopoulou K.A. (2006), *Systems for Environmental Management in Greek Companies: Driving forces and Major Benefits*.
- Mantica C., Zoppis G. (2011), *Design e innovazione a servizio della comunità*, in «Ottagono», n. 24.
- Manzini E. (1990), *Artefatti. Verso una nuova ecologia dell'ambiente artificiale*, Domus Academy, Milano.
- Marcuse H. (1999), *L'uomo a una dimensione*, Einaudi, Torino.
- Marshall D. (2004), *New Media Cultures*. Londres: Arnold Publishers.
- Marx K., Engels F. (1967), *Manifesto del partito comunista*, Avanzini e Torracca Editori, Roma.
- Masi D. (2010), *Go Green. Il nuovo trend della comunicazione*, Logo Fausto Lupetti Editore, Milano.
- Massey D., Jess P. (a cura) (2001), *Luoghi, culture, globalizzazione*, Utet, Torino
- Mattioni R. (2011), *L'importanza di chiamarsi Brand*, Guerini e Associati, Milano.
- Mazzette A. (curated by) (2011), *Esperienze di governo del territorio*, Laterza, Bari-Roma.
- McCarthy E.J. (1960), *Basic Marketing: a Managerial Approach*, Irwin, Homewood.
- Mccoy J. (2002), "Work Environments", in R.B. Bechtel, A. Churchman (eds.), Wiley, New York.
- Méndiz A. (2010), "Estrategias de sensibilización medioambiental en los niños: el Advergaming" in D. Ros 2001 (curated by), Dykinson, Madrid.
- Micheletti M. (2003), *Political Virtue and Shopping. Individuals, Consumerism and Collective Action*, Palgrave Macmillan, London.
- Moffit S., Dover M. (2012), *Wiki Brands*, Franco Angeli, Milano.
- Moore O. (2006), *Understanding postorganic fresh fruit amd vegetable consumers at participatory farmer's markets in Ireland: reflexivity, trust and social movements*, in «International Journal of Consumer Studies» 30, 5.
- Morozzi C. (1998), *Oggetti risorti*, Costa & Nolan, Genova.
- Morselli M. (curated by) (2011), *Atti dei seminari di Ecomondo*, mayli, Rimini.
- Musarò P. (2008), *Le virtù della contraddizione*, Franco Angeli, Milano.

- Musso P. (curated by) (2007), *Internal Branding. Strategie di marca per la cultura d'impresa*, Franco Angeli, Milano.
- Musso P. (curated by) (2011), *Brand Reloading*, Franco Angeli, Milano.
- Neumark D., Zhang J., Ciccarella S. (2010), *The Effects of Wal-Mart on Local Labor Markets*, in «Journal of Urban Economics», in Volume 67, Issue, n. 1, pp 1-168.
- Nussbaum M. (2011), *Non per profitto. Perché le democrazie hanno bisogno della cultura umanistica*, il Mulino, Bologna.
- Oddo F., "Architettura e pixel. Nuove prospettive di comunicazione nello scenario urbano", Architecture.it: <http://www.architecture.it/hp/copertina/29/default.htm>
- Ohmae K. (1992), *Managing in a Borderless World*, «Harvard Business Review», may-june.
- Okechuku C. (1994), *The importance of product country of origin: a conjoint analysis of the United States, Canada, Germany and The Netherlands*, in «European Journal of Marketing», vol. 21, no. 4, pp. 307-321.
- Olcese A., Rodríguez M.A., Alfaro, J. (2008), *Manual de la empresa responsable y sostenible*, McGraw-Hill, Madrid.
- Oldenburg R. (1999), *The Great Good Place: Cafes, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*, Marlowe and Company, New York.
- Oram P., Conisbee M., Simms A., (2003), *Ghost Town Britain II Death on the High Street Report*, New Economics Forum, London.
- Orbaiz L.V., Papadopoulos N. (2003), *Toward a Model of Consumer Receptivity of Foreign and Domestic Products*, in «Journal of International Consumer Marketing», vol. 15, no. 3, pp.101-126.
- Osti G. (2006), *Nuovi asceti*, Il Mulino, Bologna.
- Ottman J.A. (1998), *Green Marketing. Opportunity for Innovation*, J. Ottman Consulting Inc., New York.
- Ottman J.A. (2006), *The Rules of Green Marketing*, available at <http://www.marketingprofs.com/6/ottman1.asp>
- Ottman J.A. (2008), "The Five Simple Rules of Green Marketing", *Design Management Review*, 19(4), p.p. 65-69.
- Packard V. (1958), *I persuasori occulti*, Einaudi, Torino.
- Paddison A., Calderwood E. (2007), *Rural retailing: a sector in decline?*, in «International Journal of Retail and Distribution Management», 35 (2) 136 - 155
- Paganelli C. (2006), *Vicino al cielo. Agbar Tower*, Barcelona, in «L'Arca», n. 215.
- Paltrinieri R. (2010), "Promuovere i circoli virtuosi per una felicità responsabile", in M.L. Parmigiani, mayli, Rimini.
- Paltrinieri R. (2010), *L'uso dei beni: il rapporto tra consumi e felicità*, in «Sociologia del lavoro», Franco Angeli, Milano.
- Paltrinieri R. (2011), *Felicità responsabile: consumerismo come pratica di cittadinanza*, *Pratiche culturali e reti di consumo. Luoghi plurali e nuove forme di partecipazione*, «Rivista Pic-Ais, Culture and Communication», n. 2.
- Paltrinieri R., Parmiggiani P. (curated by) (2008), *Per un approccio sociologico al marketing*, Franco Angeli, Milano.
- Panizza M (2001), *La torre rompe la scatola*, in« Domus», n. 840.
- Papadopoulos I., Karagouni G., Trigkas M., Platogianni E. (2010), *Green marketing: The case of Greece in certified and sustainably managed timber products*, in «EuroMed Journal of Business», Vol. 5, Iss. 2, pp.166-190.
- Papadopoulos N., Heslop L.A., Beracs J. (1990), National stereotypes and product evaluations in a socialist country, in «International Marketing Review», 7, 32.
- Papaevangelou D.S. (2008), "The concept and practice of Corporate Social Responsibility", unpublished phd, National School of Public Administration, Athens.
- Parmiggiani P. (2001), *Consumatori alla ricerca di sé*, Franco Angeli, Milano.
- Parmigiani M.L. (2010), *Siamo tutti stakeholder*, mayli, Rimini.

- Pauli G. (2010), *Blue Economy. Nuovo rapporto al Club di Roma*, Edizioni Ambiente, Milano.
- Peattie K. (1995), *Environmental Marketing Management. Meeting the green challenge*, Pitman Publishing, Londra.
- Pellizzoni L., Osti G. (2003), *Sociologia dell'ambiente*, Bologna, Il Mulino.
- Perdiguerro T.G., García-Reche A. (2011), *RSE. Cultura, políticas y prácticas de responsabilidad de las empresas del IBEX-35*, Observatorio RSE Universitat de València, available at: <http://www.observatoriorse.org.es/Estudios%20e%20Informes/Estudio%202011%20Cultura,%20Pol%C3%A9ticas%20y%20Pr%C3%A1cticas%20de%20Responsabilidad%20Social%20de%20las%20empresas%20del%20IBEX35.pdf> ultima data di consultazione: 18 march 2012.
- Perez M.P., Cavallo M., Stacchini V., Mantidi A. (2012), *Linee guida su servizi innovativi*, Progetto Ecomark, Bologna.
- Perulli P. (2007), *La città*, Mondadori, Milano.
- Pieretti G. (1996), *Per una cultura dell'essenzialità: studi e ricerche sulle moderne povertà urbane*, Franco Angeli, Milano
- Pike A. (2010), *Origination: How brands are capturing the power of place and why it matters*, Inaugural Lecture, Great North Museum, Newcastle upon Tyne (<http://www.ncl.ac.uk/curds/assets/documents/FinalInauguralLectureBooklet-Origination.pdf>)
- Pilati C. (2006), *Uno spazio da interpretare*, in «Ottagono», february.
- Pilotti L. (1997), *La reingegnerizzazione dei sistemi locali territoriali di servizio: il caso dell'area turistica e commerciale gardesana*, in «Commercio», n.60
- Pine J., Gilmore J.H. (2000), *L'economia delle esperienze*, Etas, Milano.
- Pinillos A. (2009), RSC 2.0. *Una herramienta de competitividad para el futuro*, in «Telos», n° 79, june, pp. 100-111. <http://sociedadinformacion.fundacion.telefonica.com/telos/cuadernograbar.asp?idarticulo=6&rev=79.htm>; ultima data di consultazione 08 march 2011.
- Pirenne H. (1995), *Le città del Medioevo*, Editori Laterza, Roma.
- Pirog R. (2005), *Calculating the food miles for a multiple ingredient food product, report of the Leopold Center, Iowa*, available at: http://www.farmland.org/programs/localfood/documents/foodmiles_Leopold_IA.pdf
- Pirog R., Benjamin A. (2003), *Checking the Food Odometer: Comparing Food Miles for Local Versus Conventional Produce Sales to Iowa Institutions*, Leopold Center for Sustainable Agriculture, july.
- Polonsky M.J., Rosenberger P.J. (2001), *Re-evaluating to green marketing – An integrated approach*, «Business Horizons», 44(5), 21-30.
- Porter, M., 1991, *America's Green Strategy*, In: "Scientific American", 264 (4)
- Porter M.E. (1980), *Competitive strategy*, New York, Free Press.
- Porter M.E. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, New York.
- Porter M.E. (1990), *The Competitive Advantage of Nations*, New York, Free Press.
- Porter R., Kramer M. (2006), *Strategy & Society: the link between Competitive advantage and CSR*, New York.
- Porter M., Van der Linde C., 1995, *Toward a new conception of the environment competitiveness relationship*. In: "Journal of Economic Perspective", 9 (4)
- Power J. (2011), *Local Heroes: A study of the economic, financial and social significance of the independent retail grocery sector*, RGDATA Ireland, december.
- Prahalad C.K., Ramaswamy V. (2000), *Co-opting customer competence*, in «Harvard Business Review», January-February.
- Prahalad C.K., Ramaswamy V. (2004), *Il futuro della competizione. Co-creare valore eccezionale con i clienti*, Il Sole 24 ore, Milano.

- Prakash A. (2002), *Green marketing, publica policy and managerial strategies*, «Business Strategy and the Environment Bus», Strat. Env. 11, 285-297.
- President's Council for Sustainable Development, *Eco-Industrial Park Workshop Proceedings*, October 17-18, Virginia, Cape Charles, USA, 1996. available at: http://clinton2.nara.gov/PCSD/Publications/Eco_Workshop.html (ultimo accesso 15 march 2012).
- Prunesti A. (2010), *Enterprise 2.0*, Franco Angeli, Milano.
- Putnam R. (2002), *Capitale sociale e individualismo*, il Mulino, Bologna.
- Qualizza G. (2006), *Dai distretti industriali ai meta-distretti della conoscenza*, in «Geo-innovare», n. 2.
- Qualizza G. (2009), *Nuove frontiere della comunicazione tra identità, valori ed etica*, in «Corem», Mcs Press, Trieste.
- Qualizza G. (2010), *Transparent Factory. Quando gli spazi del lavoro fanno comunicazione*, Franco Angeli, Milano. Random House, Canada.
- Regione Marche (2005), *Buone pratiche per la gestione ambientale delle aree industriali*, Swer Multimedia, Torino.
- Restart Ernst&Young's (2011), *European Attractiveness Survey*, available at: www.ey.com/attractiveness
- Riesman D. (1956), *La folla solitaria*, Il Mulino, Bologna.
- Rifkin J. (2000), *L'era dell'accesso*, Arnoldo Mondadori Editore, Milano.
- Ritzer G. (1997), *Il mondo alla McDonald's*, Il Mulino, Bologna.
- Ritzer G. (2000), *La religione dei consumi*, il Mulino, Bologna.
- Ritzer G. (2006), *"I concetti di "nothing" e "something" nella disperata ricerca del significato dei marchi e nelle comunità di marca"*, in E. Di Nallo, R. Paltrinieri (curated by), Franco Angeli, Milano.
- Rizzo A. (2012), *Place Branding*, in www.brandforum.it, sezione brand trends, 21 february.
- Roberts K. (2006), *Lovemarks: The Future Beyond Brands*, Power House Books, New York.
- Roberts K. (2007), *Effetto lovemarks*, Franco Angeli, Milano.
- Rogge K., Schneider M., Hoffmann V., 2011, *The innovation impact of the EU Emission trading system. Findings of company case studies in the German power sector*, In: "Ecological Economics", 70
- Ros D. (curated by), *EBranding verde*, Dykinson, Madrid.
- Rose G. (2001), *"Luogo e identità: un senso del luogo"*, in D. Massey, Jess P. (a cura), Utet, Torino, pp. 65-89.
- Rotondi M., Passerini W. (2011), *Wellness organizzativo*, Franco Angeli, Milano.
- Rullani E. (2004), *La fabbrica dell'immateriale*, Roma, Carocci.
- Sacconi L. (2011), *"From individual responsibility to shared' social responsibilities: concepts for a new paradigm"*, in *Towards an Europe of shared social responsibilities, Challenges and strategies*, Unione Europea Publishing.
- Salomoni C. (2011), *Qualità e Welfare. Il caso Luxottica*, Guerini e Associati.
- Santolini R. (2010), *Servizi ecosistemici e sostenibilità*, in «Ecoscienza», n. 3, pp. 20-23.
- Sassoon J. (2012), *Web storytelling*, Franco Angeli, Milano.
- Schlarb M. (2001), *Eco-industrial development: a strategy for building sustainable communities*, Washington DC, Cornell University-United States Economic Development Administration.
- Schmitt B., Simonson A. (1997), *Marketing aesthetics. The strategic management of brands, identity and image*, The Free Press, New York.
- Schumacher P. (2004), *Hadid digitale. Paesaggi in movimento*, Testo & Immagine, Torino.
- Schumpeter J.A. (1973), *Capitalismo, socialismo e democrazia*, Etas Kompass, Milano.
- Scolari C. (2008), *Hipermediaciones. Elementos para una teoría de la comunicación digital interactiva*, Gedisa Editorial, Barcelona.

- Sedita S.R., Pilotti L., Valentini N. (2008), *Strategie e pratiche ecologiche per apprendere ad apprendere in contesti complessi e innovativi. Il matching tra cultura e comunità di pratica nel caso H-Farm: tra meta-corporation emergente ed ecologie del valore*, Università degli Studi di Milano, Dipartimento Scienze economiche, aziendali e statistiche, Working Paper n. 33.
- Semprini A. (1993), *La marca postmoderna*, Franco Angeli, Milano.
- Semprini A. (1996), *La marca*, Lupetti Milano.
- Semprini A. (2006), *Marche e mondi possibili*, Franco Angeli, Milano
- Shi H., Chertow M., Song Y. (2010), *Developing country experience with ecoindustrial parks: a case study of the Tianjin Economic-Technological Development Area in China*, in «Journal of Cleaner Production», 18.
- Shimp T., Sharma S. (1987), *Consumer ethnocentrism: Construction and validation of the CETSCALE*, in «Journal of Marketing Research» 24, 3.
- Siebert H., 1977, *Environmental Quality and the Gains from Trade*, In: "Kyklos", 30 (4)
- Siebert H., 1990, *Economics of Environment: Theory and Policy*, Springer, Berlin
- Siemens Italia (2004), *Gli indicatori e le politiche per migliorare il sistema Italia e la sua attrattività positive*, Siemens Italia.
- Silvestri F., 2000, I Marchi di qualità dei parchi, Regione Emilia-Romagna, Collana Studi e ricerche, Bologna
- Silvestri F., 2005, *Lezioni di economia dell'ambiente ed ecologica*, CLUEB, Bologna
- Silvestri F., Ghinai S., Barone V., 2013, *Nautical tourism, carrying capacity and environmental externality in a protected Lagoon of Northern Adriatic Sea*, In: "Economics and Policy of Energy and the Environment", 3
- Simms A., Kjell P., Potts R. (2005), *Clone Town Britain Report*, New Economics Forum, London.
- Smith A., MacKinnon J.B. (2007), *The 100-Mile Diet: A Year of Local Eating*, Random House of Canada.
- Smith T. (1998), *The Green Marketing Myth: Tending our Goats at the Edge of Apocalypse*, University of Toronto Press, Toronto.
- Solano Santos L.F. (2009), *Hacia una nueva concepción de la responsabilidad social*, Doxa Comunicación 9, Madrid, november, pp. 35-49. <http://www.humanidades.uspceu.es/pdf/DOXA9-2.pdf>, ultima data di consultazione 25th of January 2011.
- Squinzi G. (2010), *Sfida sul green. Certificare sul serio*, in «Realtà Mapei. Bimestrale di attualità, tecnica e cultura», Anno 20 – n. 101.
- Stacey R. (1996), *Management e caos*, Milano, Guerini.
- Starkey R. (curated by) (2001), *Guida agli strumenti di gestione ambientale per le piccole e medie imprese*, «Environment Park/Dossier 5», Cuneo.
- Stehr N. (2007), *Die Moralisierung der Märkte. Eine Gesellschaftstheorie*, Suhrkamp Verlag, Frankfurt am Main.
- Stern N. (2009), *Un piano per salvare il pianeta*, Feltrinelli, Milano.
- Stern Th. (2003), *Policy instruments for environmental and natural resource management*, RFF/World Bank/SIDCA.
- Stiglitz J.E., Sen A., Fitoussi J.P., *Report by the Commission on the Measurement of Economic Performance and Social Progress*, available at: http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf
- Story M., Kaphingst K.M., Robinson-O'Brien R., Glanz K. (2008), *Creating Healthy Food and Eating Environments: Policy and Environmental Approaches*, in «Annual Review of Public Health», 29, pp. 253–72.
- Tagliaferri M. (2006), *Industrial Chic. Reconverting Space*, Edizioni Gribaudo, Savigliano (CN).
- Terra Choice (2007), *The Six Sins of Greenwashing. A study of environmental claims in North American Consumer Markets*, A green paper by TerraChoice Environmental Marketing Inc., november.

- Therkelsen A., Halkier H. (2008), *Contemplating Place Branding Umbrellas. The case of coordinated national tourism and business promotion in Denmark*, «Scandinavian Journal of Hospitality and Tourism», 8(2), pp. 159-179.
- Tirelli D. (2001), *Package e display. Un rapporto ambiguo*, in «Ottagono», n. 147. Truit T. (2012), *We recycle our paper, our cans, and our bottles; why not recycle (and control) our incomes? Why the 'Local Multiplier Effect' Always Counts*, available at: <http://www.geo.coop/archives/LocalMultiplierEffect1104.htm>
- Tuan Y.F. (1978), "Spazio e luogo: una prospettiva umanistica", in V. Vagaggini (a cura di), Franco Angeli, Milano
- Turner R.K., Paavola J., Cooper P., Farber S., Jessamy V., Georgiou S. (2003), *Valuing nature: lessons learned and future research directions*, in «Ecological Economics», n. 46, pp. 493-510.
- Unctad (2010), *Il contributo dell'impresa responsabile nella creazione di valore per il territorio*, World Investment Report, «Impronta Etica», march.
- Unep (2011), *Towards a Green Economy. Pathway to sustainable Development and Poverty Eradication*, St. Martin-Bellevue, France, available at: www.unep.org/greeneconomy.
- Vagaggini V. (curated by) (1978), *Spazio geografico e spazio sociale*, Franco Angeli, Milano.
- Valdani E., Ancarani F. (curated by) (2000), *Strategie di marketing del territorio*, Milano, Egea.
- Van Meel J., Vos P. (2001), *Funky offices: reflections on office design in the new economy*, in «Journal of Corporate Real Estate», Vol. 3, n. 4.
- Varchaver N. (2007), *Du Pont "Chemical Reaction"*, «Fortune magazine» 22, march.
- Veblen T. (1971), *La teoria della classe agiata*, Einaudi, Torino.
- Vercelloni M. (2002), *Il comfort nell'ufficio del nuovo millennio*, in «Office design», allegato a Interni, n. 520.
- Villafañe J. (2009), *Reputación corporativa y RSC. Bases empíricas para un análisis*, in «Telos», n. 79, june, pp. 75-82. <http://sociedadinformacion.fundacion.telefonica.com/telos/cuadernograbar.asp?idarticulo=3&rev=79.htm> ultima data di consultazione 16 march 2011.
- Vinelli M. (2002), *Un posto di lavoro dal volto umano*, in «Corriere Design», allegato al Corriere della sera, 10 april.
- Virilio P. (2000), *Dal media building alla città globale*, Crossing, n. 1.
- Visser W. (2001), *The Age of Responsibility: CSR 2.0 and the New DNA of Business*, in «Journal of Business Systems, Governance and Ethics», vol. V, n° 3, pp. 7-22. http://www.waynevisser.com/Visser_Age_of_Responsibility_Paper_2011.pdf; ultima data di consultazione 22 february 2011.
- Wackernagel M., Rees W.E. (2008), *L'impronta ecologica. Come ridurre l'impatto dell'uomo sulla Terra*, Edizioni Ambiente, Milano.
- Wagner M. (2003), *The Porter Hypothesis Revisited: A Literature Review of Theoretical Models and Empirical Tests*, Centre for Sustainability Management (CSM), University of Lüneburg, Germany.
- Wall M., Heslop L. (1986), *Consumer attitudes toward Canadian-made versus imported products*, in «Journal of the Academy of Marketing Science», n. 14.
- Watts D., Strogatz S. (1998), *Nature, Collective dynamics of smallworld*, in «Nature», Vol. 393, N. 6684.
- Weatherell C., Tregear A., Allinson J. (2003), *In search of the concerned consumer: UK public perceptions of food, farming and buying local*, in «Journal of Rural Studies», 13(4), pp. 233-244.
- Weber C.L., Matthews H.S. (2007), *Food-miles and the relative climate impact of food choices in the United States*, in «Environmental Science and Technology», 42, 3508 – 3513.
- Weber M. (2006), *L'etica protestante e lo spirito del capitalismo*, BUR, Milano.
- Webster F. (1975), *Determining the characteristics of the socially conscious consumer*, in «Journal of Consumer Research», 2 (3).

- Westwood J. (1990), *The marketing plan: a practitioner guide*, Kogan page, London.
- Wilkinson R., Pickett K. (2009), *La misura dell'anima*, Feltrinelli, Milano.
- Willemen L., Hein L., Verborg P.H. (2010), *Evaluating the impact of regional development policies on future landscape services*, in «Ecological Economics», n. 69, pp. 2244-2254.
- World Economic Forum (2007), *Growth Competitiveness Report*, available at <http://www.weforum.org/>
- Wouters C. (1986), *Formalization and Informalization: Changing Tension Balances in Civilizing Process*, in «Theory, Culture & Society», vol. III, n.2.
- Yperen . (2006), *Corporate Social Responsibility in the Textile Industry International overview available at:* <http://www.oesorichtlijnen.nl/wpcontent/uploads/Kenniscentrum/Sector%20informatie/Textiel%20Internati onal%20Overview%20CSR.pdf>
- Zamagni S., Zamagni V. (2008), *La cooperazione*, Il Mulino, Bologna.
- Zucchetti S. (2008), *Il marketing territoriale: una leva per lo sviluppo*, in «LIUC» Paper n. 214 , Serie Economia e Istituzioni, March 21st.

Additional References by chapter

Part 1 The Context for Eco-Innovative Industrial and Enterprise Zones

1.1 Territorial Marketing, Green Marketing, Industrial Areas:

- Caroli M. (2014), *Il marketing per la gestione competitiva del territorio*, Milano, Angeli.
- Cavallo, M., Degli Esposti, P., Konstantinou, K., (edited by), *Handbook of Green Communication and Marketing*, Franco Angeli, Milan, 2012.
- Franco M., (2005), *The Eco-Industrial Parks. Towards a symbiosis between architecture, production, environment*, (in Italian), Angeli, Milan.
- Grant J., (2007), *The Green Marketing Manifesto*, J. Wiley, London.
- Kotler P., Haider D.H., Rein I., (1993), *Marketing Places. Attracting Investment, Industry, and Tourism to Cities, States, and Nations*, The Free Press, New York NY.
- Jackson T., (2011), *Prosperity without Growth: Economics for a Finite Planet*, Earthscan, London.
- Pauli G., (2010), *The Blue Economy*, Paradigm Publications, New Mexico.
- UNEP, (2011), *Towards a Green Economy. Pathway to Sustainable Development and Poverty Eradication*, Nairobi, www.unep.org/green economy
- Valdani E., Ancarani F. (edited by) (2000), *Strategie di marketing del territorio*, Milano, Egea.

1.2 Policies for the Ecologically equipped productive areas' (EEPAs) development

- Boons, F., Spekkink, W., Mouzakitis, Y. (2011). The dynamics of industrial symbiosis: a proposal for a conceptual framework based upon a comprehensive literature review. *Journal of Cleaner Production*.
- Gibbs, D., Deutz, P., Proctor, A. (2005). Industrial ecology and eco-industrial development: A potential paradigm for local and regional development?. *Regional Studies*.
- Kibert, C. J. (1994). *Sustainable Construction: Proceedings of the First International Conference of CIB TG 16, November 6-9, 1994, Tampa, Florida, USA*. University of Florida, Center for Construction & Environment.
- Lowe, E. A. (1997). Creating by-product resource exchanges: strategies for eco-industrial parks. *Journal of Cleaner Production*, 5(1), 57-65.
- Lowe, E.A. (2001). *Eco-industrial park handbook for Asian developing countries*. Indigo Development, Oakland.

- Lowe, E. A., & Evans, L. K. (1995). Industrial ecology and industrial ecosystems. *Journal of Cleaner Production*, 3(1), 47-53.
- Mouzakitis Y., Adamides, E., Goutos, S. (2003). Sustainability and industrial estates: the emergence of eco-industrial parks. *Environmental Research, Engineering and Management*.
- Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard business review*, 89(1/2), 62-77.
- Research Triangle Institute (1996), 'Eco-industrial Parks: a case study and analysis of economic, environmental, technical and regulatory issues', *Final report, RTI Project Number 6050 FR*.
- Senlier, N., Albayrak, A.N. (2011). Opportunities for sustainable industrial development in Turkey: Eco-Industrial Parks. *Gazi University Journal of Science*.
- Tibbs, B.C. (1992), Industrial ecology: an environmental agenda for industry. *Whole Earth Review*.
- While, A., Jonas, A.E., Gibbs, D. (2010). From sustainable development to carbon control: eco-state restructuring and the politics of urban and regional development. *Transactions of the Institute of British Geographers*.

1.3 From consumers to prosumers, being green in the digital society

- Bordieu P. (2005), *Il senso pratico*, Armando Editore, Roma.
- Codeluppi V. (2001), *Il potere della marca*, Bollati Boringhieri, Torino.
- Cova B. (2003), *Il marketing tribale. Legame, comunità, autenticità come valori del marketing*, Il Sole 24 Ore, Milano.
- Douglas M. (1984), *Il mondo delle cose. Oggetti, valori, consumo*, il Mulino, Bologna.
- Fabris G. (2008), *Societing. Il marketing nella società postmoderna*, Milano, Egea.
- Fabris G. (2010), *La società post-crescita. Consumi e stili di vita*, Egea, Milano.
- FrancoAngeli, Milano.
- Fuchs C. (2001), *Foundations of Critical Media and Information Studies*, Routledge, London.
- Giordano A., Pallera M., (2009), "Per un'ecologia del brand", in J. Grant, Brioschi, Milano.
- Grant J. (2009), *Green Marketing. Il Manifesto*, Francesco Brioschi Editore, Milano.
- Jackson T. (2007), *Mainstreaming sustainability in local economy development practice*, in «Local Economy», 22 (1).
- Jackson T. (2011), *Prosperità senza crescita. Economia per il pianeta reale*, Edizioni Ambiente, Bologna.
- Jenkins H. (2007), *Cultura convergente*, Apogeo, Milano.
- Latouche S. (2007), *La scommessa della decrescita*, Feltrinelli, Milano.
- Lessig L. (2009), *Remix. Il futuro del copyright (e delle nuove generazioni)*, Etas, Milano.
- Levy P. (1998), *L'intelligenza collettiva. Per un'antropologia del cyberspazio*, Feltrinelli, Milano.
- Maffesoli M. (2009), *Il tempo delle tribù*, Edizioni Angelo Guerini, Milano.
- Ritzer G. (2006), "I concetti di "nothing" e "something" nella disperata ricerca del significato dei marchi e nelle comunità di marca", in E. Di Nallo, R. Paltrinieri (edit by),

1.4 Integrated vision for sustainable and innovative industrial areas

- Capra, F. (1996): *The Web of Life*, (Anchor Books, Double Day Dell Publishing Co., New York.
- Clement, J.-C. (2013): Local Smart Grids Initiatives - Towards a connected ecosystem, CCI Nice Cote d'Azur, Nice / 29 October 2013 / Global Forum Trieste.
- Costanza, R. (1997): La economía ecológica de la sostenibilidad. Invertir en capital natural, in R. Goodland, H. Daly, S. El Serafy, e B. Von Droste, (ed.), Medio ambiente y desarrollo sostenible - Más allá del informe Brundtland, (Madrid: Editorial Trotta, pp. 103-114.
- Daly, H. (1990): Commentary: Toward some operational principles of sustainable development, *Ecological*

- Economics, 2, pp. 1-6.
- Goodland, R. and H. Daly (1996): Environmental sustainability: universal and non-negotiable, *Ecological Applications*, (6), pp. 1002-1017.
- Leeuw S. and C. Aschan-Leygonie (2000): A long-term perspective on resilience in socio-natural systems, workshop System shocks – system resilience Abisko, Sweden, 22-26 may 2000.
- Millennium Ecosystem Assessment (2005): *Ecosystems and Human Well-Being: Synthesis*, Island Press, Washington, DC.
- Misiraca-Teychene, P. (2013): Collective and selective waste management project on the Carros le Broc industrial estate «CARROS INDUS'TRI», MER Project, CCI Nice Cote d'Azur, 5 of November 2013.
- Owens, S. (1995): From “predict and provide” to “predict and prevent”?: pricing and planning in transport policy, *Transport Policy*, 2(1), pp. 43-49.
- Rosa, M. P. (2013): “Implications of Complexity and Sustainability in Civil Engineering” in *International Review of Civil Engineering*, Praise Worthy Prize, Italy, January 2013, Vol. 4 n.1.
- Sachs, I. (1994): *Estratégias de transição para o século XXI. Para Pensar o Desenvolvimento Sustentável*, São Paulo, Ed. Brasiliense.
- Serageldin, I. (1993): Making development sustainable, *Finance & Dev.*, 30, pp. 6-10.
- Stawikowski, L. (2013): Workplace Mobility Plan for enterprises of Carros - Le Broc, MER Project, 5 of November 2013.
- Stephen, S.; Simms, A.; Neitzert, E. and J. Ryan-Collins (2010): *The Great Transition*, New Economics Foundation.
- Vitousek, P. M. Mooney, H. A. Lubchenco, J. and J. M. Melillo (1997): Human domination of earth's ecosystems, *Science*, (277), pp. 494-499, July 1997.
- Worster, D. (1993): *The wealth of nature: environmental history and the ecological imagination*, New York, Oxford University Press.

Part 2 Major Themes and Topics

2.1 Setting up the Institutional Framework for Eco-Innovative Industrial and Enterprise Zones: The Case of Italy

- Bollini G., Borsari L., Stacchini V., a cura di, *Insedimenti industriali e sostenibilità. Linee guida per la realizzazione delle Aree Produttive Ecologicamente Attrezzate*, Alinea, 2007
- R. Cariani, *Eco-Industrial Parks. A guide to eco-innovation, sustainability policies and operating projects in Eco-managed Industrial and Business Estates (EIBE)*, Edizioni Ambiente, 2013
- Cavallo M., Degli Esposti P., Konstantinou K., a cura di, “Green marketing for the Industrial areas. Methodologies, tools and practices”, Franco Angeli, 2012
- Cavallo M., Stacchini V., a cura di, *La qualificazione degli insediamenti industriali verso la costruzione di Aree Ecologicamente Attrezzate*, Clueb, 2007
- Eco-innovation Observatory (2013), “Europe in transition. Paving the way to a green economy through eco-innovation”, Annual report 2012, Action 7A “Studio sull'applicazione delle Apea e linee guida su Apea-EcoAP nelle Regioni Convergenza e nelle altre Regioni elaborati nell'ambito del Programma Operativo Nazionale “Governance e Azioni di Sistema” FSE 2007-2013
- Ervet, *Le aree produttive ecologicamente attrezzate in Italia. Stato dell'arte e prospettive*, Rete Cartesio, 2010
- Ervet, *La gestione sostenibile delle aree produttive. Una scelta possibile per il governo del territorio e per il rilancio delle politiche industriali*, 2006
- Formez, *Le aree Ecologicamente Attrezzate nella legislazione regionale*, 2006

Ispra, Indagine conoscitiva sull'attuazione di Emas nei Distretti Italiani", Rapporto 166/2012

Meid project, Sustainable Industrial Areas in Mediterranean countries. Toolkit for MESs and Local Authorities, 2013 Enea

Milano Metropoli, Ambiente Italia Istituto di ricerche, Progetto Ripensare le Aree Produttive. Regole, progetti e gestione per la qualità ambientale e funzionale. Linee guida per la promozione e gestione di Aree Produttive Ecologicamente Attrezzate in Provincia di Milano, 2009

Rete Cartesio. Ecodistretti 2009, Made "green" in Italy: le politiche ambientali dei sistemi produttivi locali e dei distretti industriali, Franco Angeli, 2010

Sipro, Programmare e realizzare e realizzare Aree Ecologicamente Attrezzate. Attori, strumenti, contenuti, Editrice Compositori, 2007

Unep, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, 2011

2.3 Environmentally Sustainable Infrastructures

2.3.2 An Example of Environmentally Sustainable Infrastructures: Industrial Waste Management

Industrial Waste Treatment Handbook (Second Edition) Author(s):Woodard & Curran Inc. ISBN: 978-0-7506-7963-3

Industrial Waste Management, EPA Protecting Land Ground Water Surface Water Air

Industrial solid waste management in an industrial park, B. Mokhtarani, N. Mokhtarani, M. R. Alavi moghadam, R. Rezaei, H. Khaledi Mehr

The International Handbook On Environmental Technology Management, Dora Marinova , David Annandale , John Phillimore, Published by Edward Elgar Publishing Limited, 2006

RCRA Orientation Manual 2011: Resource Conservation and Recovery Act. Managing nonhazardous solid waste <http://www.epa.gov/osw/inforesources/pubs/orientat/rom2.pdf>

<http://www.unido.org/en/what-we-do/environment/resource-efficient-and-low-carbon-industrial-production/cp/cleaner-production.html>

2.3.3 Comfort Pursuit in Buildings

DE GIULI V., ZECCHIN R., SALMASO L., CORAIN L., DE CARLI M., 2013, *Measured and perceived indoor environmental quality: Padua Hospital case study*; Building and Environment: N.59, pp. 211–226.

MASOTTI C., 2012, *Comfort estivo e risparmio energetico in architettura*, Maggioli editore.

NICOL F., HUMPHREYS M., 2001, *Adaptive thermal comfort and sustainable thermal standards for buildings in Moving Thermal Comfort Standards into the 21st Century: Conference Proceedings*, Windsor, 5-8 April 2011, Oxford Centre for Sustainable Development.

VAN HOOFF J., KORT H. S. M., HENSEN J. L. M., DUIJNSTEE M. S. H., RUTTEN P. G. S., 2010, *Thermal comfort and the integrated design of homes for older people with dementia*; Building and Environment: N.45, pp. 358–370.

2.3.4 Sustainable stormwater management

Escuder-Bueno, I., Andrés-Doménech, I., Perales-Momparler, S. and Morales-Torres, A. (2014). 'Work Package 3.B: State of the art, analysis and proposed indicators and adaptation measures: Stormwater management methods and techniques'.www.e2stormed.eu

Perales-Momparler, S. and Valls-Benavides, G. (2013). 'Sustainable Drainage Systems (SuDS)', Paissea. Waterscapes.

Philip, R. (2011). 'Module 4. Stormwater- Exploring the options. SWITCH Training Kit. Integrated urban water

management in the city of the future'. [Online] SWITCH Project. ICLEI European Secretariat GmbH. Available at: <http://www.switchtraining.eu/modules/module-4/#c68>

USEPA (2014). Green infrastructure. United States Environmental Protection Agency. [Online]. Available at: <http://water.epa.gov/infrastructure/greeninfrastructure/>

Woods-Ballard, P., Kellagher, R., Martin, P., Jefferies, C., Bray, R., & Shaffer, P. (2007). 'The Suds Manual'. CIRIA. Londres.

2.3.5 Integrating Renewable Energy Systems in Mediterranean Landscape

Various Authors, 2013. Enerscapes: Territory, Landscape And Renewable Energies. Methodology, Future Perspectives And Guidelines For Integration Of Renewable Energies In Mediterranean Landscapes – Med Project Final Publication.

Arnstein, S. R., 1969. "A Ladder of Citizen Participation", JAIP, Vol. 35, No. 4, pp. 216-224.

Cosgrove D.E., 1998. Social formation and Symbolic Landscape, Wisconsin Univ. Press.

Donadieu P., Périgord M., Scazzosi L., 2007. Le paysage entre nature et culture, Armand Colin, Paris.

English Heritage, Winter 2004-2005. Conservation Bulletin, Issue 47.

Forman R.T., 1995. Land mosaics, the ecology of landscapes and regions, Cambridge University Press, Cambridge.

Gambino R., 1997. Conservare innovare. Paesaggio, ambiente, territorio, Utet, Torino.

Generalitat de Catalunya, Departament de Política territorial i Obres Públiques, 2007. Per una correcta gestió del paisatge. Línies guida, Graficas Verona, Barcelona.

Masbouni A. (ed), 2002. Penser la ville par le paysage, Editions de La Villette, Paris.

Merida Rodriguez, M. y Lobón Martín, R. (Coords.), 2012. Paisajes solares. Integración paisajística de plantas fotovoltaicas en Andalucía. Sevilla, Centro de Estudios Paisaje y Territorio – Consejería de Fomento y Vivienda. Junta de Andalucía.

Priore R., 2009. No People, No Landscape. La Convenzione europea del paesaggio: luci e ombre nel processo di attuazione in Italia, Franco Angeli, Milano.

Roger A., 1997. Court traité du paysage, Gallimard, Paris.

Rogers R., 1999. Towards an Urban Renaissance, London.

Rykwert J., 2000. The Seduction of Place: The City in the 21st Century, Weidenfeld & Nicholson.

Stremke, S. & Dobbelsteen, A. V. D. 2012. Sustainable Energy Landscapes: Designing, Planning and Development, Boca Raton, CRC (Taylor & Francis group).

Schama S., 1996. Landscape and Memory, Knopf Doubleday Publishing Group, London.

Wascher D.M., 2004. Landscape Indicator Development: Steps towards a European Approach, Wageningen UR Frontis Series Nr. 4, Kluwer Academic Publishers, Dordrecht.

Wissen U., Grêt-Regamey A., 2009. Advanced analysis of spatial multi-functionality to determine regional potentials for renewable Energies, REAL CORP 2009: CITIES 3.0 – Smart, Sustainable, Integrative Strategies, concepts and technologies for planning the urban future.

Various Authors, 2013. In "I quaderni di Careggi – Presentation of the seminar on Renewable energies and Landscapes", Issue N.4, Firenze 03/2013, Uniscape, Proceedings of the 4th Careggi Seminar.

2.5 Taking Advantage of Green Marketing Plans

Boons, F., Spekkink, W., Mouzakitis, Y. (2011). The dynamics of industrial symbiosis: a proposal for a conceptual framework based upon a comprehensive literature review. *Journal of Cleaner Production*.

Gibbs, D., Deutz, P., Proctor, A. (2005). Industrial ecology and eco-industrial development: A potential paradigm for local and regional development?. *Regional Studies*.

Kibert, C. J. (1994). Sustainable Construction: Proceedings of the First International Conference of CIB TG 16, November 6-9, 1994, Tampa, Florida, USA. University of Florida, Center for Construction & Environment.

Lowe, E. A. (1997). Creating by-product resource exchanges: strategies for eco-industrial parks. *Journal of*

Cleaner Production, 5(1), 57-65.

Lowe, E.A. (2001). Eco-industrial park handbook for Asian developing countries. Indigo Development, Oakland.

Lowe, E. A., & Evans, L. K. (1995). Industrial ecology and industrial ecosystems. *Journal of Cleaner Production*, 3(1), 47-53.

Mouzakitis Y., Adamides, E., Goutos, S. (2003). Sustainability and industrial estates: the emergence of eco-industrial parks. *Environmental Research, Engineering and Management*.

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard business review*, 89(1/2), 62-77.

Research Triangle Institute (1996), 'Eco-industrial Parks: a case study and analysis of economic, environmental, technical and regulatory issues', *Final report, RTI Project Number 6050 FR*.

Senlier, N., Albayrak, A.N. (2011). Opportunities for sustainable industrial development in Turkey: Eco-Industrial Parks. *Gazi University Journal of Science*.

Tibbs, B.C. (1992), Industrial ecology: an environmental agenda for industry. *Whole Earth Review*.

While, A., Jonas, A.E., Gibbs, D. (2010). From sustainable development to carbon control: eco-state restructuring and the politics of urban and regional development. *Transactions of the Institute of British Geographers*.

2.6 Promoting Green Logistics and Mobility Management

Ecomark innovative services guidelines

Ecomark project, 2012

http://www.ecomarkproject.eu/userfiles/documents/Public/Innovative%20services%20guidelines/published/D4_A_2_Guideline_EN.pdf

Ecomark sustainable logistics booklet

Ecomark project, 2012

http://www.ecomarkproject.eu/userfiles/documents/Public/Sustainable%20logistics%20booklet/published/D4_C_3_LOGISTICS_EN.pdf

Ecomark experimentation final report

Ecomark project, 2012

http://www.ecomarkproject.eu/userfiles/documents/Public/Experimentations/published/D5_G1%20Experimentations'%20Final%20report_EN.pdf

Eco-scp-med toolkit for Sustainable management of industrial areas

Eco-scp-med project, 2014

Delivering Tomorrow: Towards Sustainable Logistics

Deutsche Post DHL, 2010

http://www.dpdhl.com/content/dam/logistik_populaer/trends/StudieSustainableLogistics/study_towards_sustainable_logistics.pdf

Penske Logistics Debuts 3PL CEO Sustainability Report

Penske and Northeastern University's College of Business Administration, 2010

http://www.penskelogistics.com/newsroom/2010_4_22_logistics_sustainability.html

Macro-benchmarking Study

MER project, 2014

Part 3 Key Issues in Fostering Eco-Innovative Industrial Areas and Enterprise Zones

3.2 Coaching Local Administrative Bodies to Manage the Redevelopment of Brownfield Sites: The case of COBRAMAN project

Borecky, K., Ertel, T. (eds) (2012) Best practices in brownfield management. Most: Statutory city of Most – municipality.

Cobraman web-page at <http://www.cobraman-ce.eu/>.

3.7 Territorial Observatory on Sustainability in San Marino: a profitable governance tool

Moreno-Pires S, Fidelis T (2012) A proposal to explore the role of sustainability indicators in local governance contexts: The case of Palmela, Portugal, *Ecological Indicators*, 23:608-615. DOI: 10.1016/j.ecolind.2012.05.003

Shieldsa D.J, Šolarb S.V, Martinc W.E (2002) The role of values and objectives in communicating indicators of sustainability, *Ecological Indicators*, 2:149-160. DOI: 10.1016/S1470-160X

Repettia A, Desthieux G (2006) A Relational Indicator set Model for urban land-use planning and management: Methodological approach and application in two case studies, *Landscape and Urban Planning*, 77:196-215. DOI: 10.1016/j.landurbplan.2005.02.006

Márton P (2012), A territorial understanding of sustainability in public development, *Environmental Impact Assessment Review*, 32:61-73, DOI: 10.1016/j.eiar.2011.03.004

Scipioni A, Mazzi A, Mason M, Manzardo A (2009), The Dashboard of Sustainability to measure the localurban sustainable development: The case study of Padua Municipality, *Ecological Indicators*, 9: 364–380, DOI: 10.1016/j.ecolind.2008.05.002

Maxim M (2012) Building shared socio-economic indicators for biodiversity. A case study in the Ile-de-France region (France), *Ecological Indicators*, 13: 347–357. DOI: 10.1016/j.ecolind.2011.05.015

Stratford J.S (1988) United States economic indicators: Definitions, sources, and resources, 15:231–236. DOI: 10.1016/0277-9390

Morse S (2003) For better or for worse, till the human development index do us part?, *Ecological Economics*, 45:281–296. DOI: 10.1016/S0921-8009

Streimikiene D, Ciegis R, Grundey D (2007), Energy indicators for sustainable development in Baltic States, *Renewable and Sustainable Energy Reviews*, 11:877–893. DOI: 10.1016/j.rser.2005.06.004

Gösslinga S, Hanssonb C.B, Hörstmeierc O, Saggeld S (2002) Ecological footprint analysis as a tool to assess tourism sustainability, *Ecological Economics*, 43:199–211. DOI: 10.1016/S0921-8009

Smeets E, Weterings R (1999) Environmental indicators: Typology and overview.<http://www.eea.europa.eu/publications/TEC25> Accessed 15 November 2012

Stiglitz E, Amartya S, Fitoussi J.P Report by the Commission on the Measurement of Economic Performance and Social Progress http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf Accessed 15 November 2012
Consiglio Nazionale dell'Economia e del Lavoro, La misurazione del Benessere Equo e Sostenibile (BES), http://www.cnel.it/application/xmanager/projects/cnel/attachments/temi_evidenza/files/000/000/005/BES_2.pdf Accessed 15 November 2012

Kaneda T, Lee M, Pollard K (2011) SCL/PRB Index of Well-Being in Older Populations Final Report, Global Aging and Monitoring Project, <http://longevity3.stanford.edu/wpcontent/uploads/2011/09/SCL-PRB-Index-of-Well-Being-in-Older-Populations.pdf> Accessed 15 November 2012

Patrizia Battilani e Stefano Pivato, A cura di (2010) Il turismo nei piccoli borghi, fra cultura e ridefinizione dell'identità urbana: il caso san Marino – Vol. 31 Collana Studi Storici Sammarinesi

Aldo Bonomi (1999) Il distretto del piacere - Bollati e Boringhieri

R. Broccoli, C. Ceccoli, C. Guglielmi, M. Turci, A cura di (2008) San Marino Patrimonio mondiale dell'Umanità – Guida alla visita inserita sul sito istituzionale www.visitsanmarino.com

Denis Cecchetti, Antonello Scorcu, Alessia Mariotti, A cura di (2008) Rapporto sul sistema turistico sammarinese – Confederazione Sammarinese del Lavoro

Richard Ingersoll (2004) Sprawltown, Meltemi

Andreas Kipar, A cura di (1994) Quaderno verde per la Repubblica di San Marino – Dicastero Ambiente Territorio ed Agricoltura

Andrea Pollarini, A cura di (2007) Tutti i colori del verde – Franco Angeli Editore

Davide Bagnaresi (2009) Miti e stereotipi: l'immagine di San Marino nelle guide turistiche dall'ottocento ad oggi - Vol. 29 Collana Studi Storici Sammarinesi

Centro Naturalistico Sammarinese (2008) Scritti, studi e ricerche di storia naturale della Repubblica di San Marino, volume n.1, 1997-2007 – Centro Naturalistico Editore

Emanuele Guidi, Conrad Mularoni e Daniele Cesaretti (2013) San Marino 2020 un buon esempio da seguire – Carlo Filippini Editore

UN World Tourism Organization (2004) Guide on Indicators of Sustainable Development for Tourism Destinations
<http://www.e-unwto.org/content/x53g07/fulltext?p=7ea9de370c184005b5a59d3f076dd38a&pi=0#section=890050&page=13&locus=12>

Valeria Stacchini (2004) San Marino: Città-Stato, città-cartolina, città-lineare, città-mercato... città-normale – Tesi di laurea

Matteo Trollo (2011) Storia e protagonisti del turismo a San Marino, un contributo essenziale all'economia della Repubblica - Vol. 33 Collana Studi Storici Sammarinesi

N. Chambers, C. Simmons, M. Wackernagel (2002) Manuale delle impronte ecologiche – Edizione Ambiente

Emanuele Guidi (2006) Gli uomini ed il Titano - AIEP Editore

Ufficio Informatica, Tecnologia, Dati e Statistica - Relazione Economico Statistica – Novembre 2012 e 2013.

Nomisma (1994) Traiettorie di sviluppo, a cura del Discatere Industria e Artigianato

Luigi Bruzzi, Simona Verità, Francisco Serrano Bernardo, Enrique Toscano (2014), Territorial Observatory on Sustainability in the Republic of San Marino: a case study, in Roberta Salomone, Giuseppe Saija, Pathways to Environmental Sustainability. Methodologies and Experiences (2014), Springer

Luigi Bruzzi, Emanuele Guidi, A cura di (2014) Coltivare il Futuro. Un osservatorio per la sostenibilità a San Marino, Carlo Filippini Editore

3.8 Green Urban Regeneration. La Foia Case Study, Valencia

Design guide and good practices references

1. “Industrial Park (Re) Development. Guide of good Practice” European Commission.
2. “Resumen de ponencias, Congreso nacional de áreas empresariales”. CEPE 2006.
3. “Guía de integración paisajística de Polígonos industriales y Sectores de Actividad Económica de Catalunya”. Departamento de Política Territorial y Obras Públicas.
4. “Guía de buenas prácticas ambientales, Polígonos Industriales”. Fundación Centro de recursos ambientales Navarra.
5. Establecimiento de criterios ambientales para la Ubicación, Diseño, Construcción y funcionamiento del los Polígonos Industriales” Junta de Idalucía. Consejería de Medio Ambiente.

Bibliographic references

1. María Teresa López Sang, University of Alicante, Apdo. 03080, Campus San Vicente del Raspeig, Alicante (Spain). The management of Green Infrastructure in the Iberian Southeast (Valencia, Spain). Journal of Biodiversity 45.
2. Valencia strategy, Vision 2020, the Valencian industrial policy. Ministry of Economy, Industry, Tourism and Employment.
3. Busquets, Jaume y Cortina, Albert. “Gestión del paisaje. Manual de protección y ordenación del paisaje” Barcelona 2009.
4. McHarg, Ian. “Proyectar con la naturaleza”.
5. Tandy, Cliff. “Industria y paisaje”.
6. Cullen, Gordon. “ Urban Ladscape”.
7. Lynch, Kevin. “ La imagen de la ciudad”.

3.9 Energy and Comfort in School Buildings in the South of Portugal

- Axley, J. (2007). Multizone Airflow Modelling in Buildings: History and Theory, HVAC&R Research, 13(6):907-928, 2007.
- Conceição, E. (2003). Numerical Simulation of Buildings Thermal Behaviour and Human Thermal Comfort Multi-node Models, Building Simulation 2003, Eindhoven, Holanda, 11 a 14 de Agosto de 2003.
- Conceição, E., Lúcio, M.^a M. (2005). Estudo Térmico de Edifícios Escolares na Região do Algarve em Condições de Inverno, Quarto Encontro Nacional do Colégio de Engenharia Mecânica, Lisboa, Portugal, 2 a 4 de Junho de 2005.
- Conceição, E., Lúcio, M.^a M. (2006a). Numerical Study of Thermal Response of School Buildings in Summer Conditions, Healthy Buildings 2006, Lisboa, Portugal, 4 a 8 de Junho de 2006.
- Conceição, E., Lúcio, M.^a M., (2006b). Air quality Inside Compartment of a School building: Air Exchange Monitoring, Evolution of Carbon Dioxide and Assessment of Ventilation Strategies, The International Journal of Ventilation, 5(2), September 2006.
- Conceição, E., Silva, A., Lúcio, M.^a M. (2004). Numerical Study of Thermal Response of School Buildings in Winter Conditions. RoomVent 2004, Coimbra, Portugal, 5 a 8 de Setembro de 2004.
- Donaisky, E., Oliveira, G., Freire, R., Mendes, N. (2007). PMV-Based Predictive Algorithms for Controlling Thermal Comfort in Building Plants, Proceedings of Part of IEEE Multi-conference on Systems and Control: 182-187, 1-3 de Outubro de 2007.
- Fanger, O. (1972). Thermal Comfort Analysis and Application in Environmental Engineering, McGraw-Hill, 1972.
- Freire, R., Oliveira, G. Mendes, N. (2008). Predictive controllers for Thermal Comfort Optimization and Energy Savings, Energy and Buildings, 40(7):1353-1365, 2008.
- Hadjiski, M., Sgurev, V., Boishina, V. (2007). HVAC Control via Hybrid Intelligent Systems, Cybernetics and Information Technologies, 7(1): 77-94, 2007
- Hong, L., Jia, L., Shulan, K., Zhaosheng, Z. (2007). Predictive Functional Control Based on Fuzzy T-S Model for HVAC Systems Temperature Control, Journal of Control Theory and Applications, 5(1):94-98, 2007.
- Hongli, L., Peyong, D., Lei, J. (2008). A Novel Fuzzy Controller Design Based-on PID Gains for HVAC Systems. Proceedings of 7th World Congress on Intelligent Control and Automation, 1-23:736-739, 25-27 de Junho de 2008.
- Huh, J., Brandemuhel, M. (2008). Optimization of Air-conditioning System Operating Strategies for Hot and Humid Climates, Energy and Buildings, 40(7): 202-1213, 2008.
- Iqbal, M. (1983). An Introduction to Solar Radiation, Academic Press, Canada, 1983.
- ISO 7730 (2005). Ergonomics of the Thermal Environments – Analytical Determination and Interpretation of Thermal Comfort Using Calculation of the PMV and PPD indices and Local Thermal Comfort Criteria, International Standard, Switzerland.
- Komareji, M., Stoustrup, J., Rasmussen, H., Bidstrup, N., Svendsen, R., Nielsen, F. (2008). Optimal Model-based Control in HVAC Systems, Proceedings of American Control Conference: 1443-1448, 11-13 de Junho de 2008.
- Leephakpreeda, T. (2008). Grey Prediction on Indoor Comfort Temperature of HVAC Systems, Expert Systems with Applications, 34(4):2284-2289, 2008.
- Liang, J., Du, R. (2007). Design of Intelligent Comfort Control System with Human Learning and Minimum Power Control, Energy Conversion and Management, 49(4):517-528, 2008.
- Ly, H., Duan, P., Jia, L. (2008). One Novell Fuzzy Controller Design for HVAC Systems, Proceedings of Chinese Control and Decision Conference, 1-11:2071-2076, 2008.
- Mendes, N., Barbosa, R., Freire, R., Oliveira, R. (2008). A Simulation Environment for Performance analysis of HVAC Systems, Building Simulation, 1(2):129-143, 2008.
- Nassif, N., Moujaes, S., Zaheeruddin, M. (2008). Self-tuning Dynamic Models of HVAC System Components, Energy and Buildings, 40(9):1709-1720, 2008.

- Redfern, A., Kopow, M., Wright, P. (2006). Design Architecture for Multi-Zone HVAC Control Systems from Existing Single-Zone Systems Using Wireless Sensor Networks, *Proceedings of Smart Structures, Devices and Systems III*, 6414, 11 de Dezembro de 2006.
- Sane, H., Haugstetter, C., Burnoff, S. (2006). Building HVAC Control Systems – role of controls and Optimization, *Proceedings of American Control Conference*: 4483-4488, 14 de Junho de 2006.
- Song, F., Zhao, B., Yang, X., Jiang, Y., Gopal, V., Dobbs, G., Sahm, M. (2008). A New Approach on Zonal Modelling Environment with Mechanical Ventilation, *Building and Environment*, 43(3):278-286, 2008.
- Wang, S., Ma, Z. (2008). Supervisory and Optimal Control of Building HVAC Systems: A Review, *HVAC&R Research*, 14(1):3-32, 2008.
- Yan, Y., Zhou, J., Lin, Y., Yang, W., Wang, P., Zhang, G. (2008). Adaptive Control Model for Building Cooling and Heating Sources, *Energy and Buildings*, 40(8):1394-1401, 2008.

Part 4 Experience Elsewhere and a View of the Future

4.3 The Chinese Experience

- Monballiu, A., Chiang, Y., Garsany, C., Meesschaert, B. 2012. Potentials of Regional Industrial Symbiosis on Waste Material Valorisation and Pollution Prevention in West Flanders. Available at: <https://lirias.kuleuven.be/bitstream/123456789/369439/3/WTRS+WTAfvalwater+English+version.pdf>
- Holländer R., et al. 2009. Sustainable Development of Industrial Parks. Available at: http://www.wifa.uni-leipzig.de/fileadmin/user_upload/AP/UL-WiFa_AP81_Hollaender_Wu_Duan.pdf
- Ling Zhang, et. al. 2009. Eco-industrial parks: national pilot practices in China. Available at: <http://www.sciencedirect.com/science/article/pii/S0959652609003941>
- Qinghua ZHU, et. al. 2007. Industrial Symbiosis in China: A Case Study of the Guitang Group. Available at: <http://onlinelibrary.wiley.com/doi/10.1162/jiec.2007.929/abstract>
- Cohen-Rosenthal E. 2003. *Eco-Industrial Strategies: Unleashing Synergy between Economic Development and the Environment*. Greenleaf Publishing Limited. pp. 349–351.



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