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Sustainable Industrial Areas in Mediterranean countries. Toolkit for SMEs and Local Authorities

MEID project

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Sustainable Industrial Areas in Mediterranean countries.
Toolkit for SMEs and Local Authorities

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Toolkit for SMEs and Local Authorities

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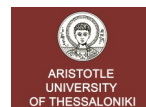
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Introduction

For a long time **Industrial Areas (IAs)** have been a source of benefits and conflicts for local population due to their proximity with the cities and the related environmental, social and economic impact. For this reason, these Areas became the places where to apply sustainable development principles and tools. IAs are in fact relevant both for local territorial planning and managing and for the possibility to share infrastructures, services and technologies, while reducing costs and creating synergies among companies in the Area. There are many examples of IAs where elements of environmental and social improvements have been applied. These experiences are often called with different names such as Eco-industrial Parks, Ecologic Equipped Areas, and so on and, despite there are still no common standards, they are a good starting point for IAs enhancement.

Today there is increasing consensus that the only way to ensure a sustainable growth is to decouple economic growth from resource use and pollution, namely an economy with the ability of growing without corresponding increased pressures on the environment. Unfortunately, despite some progress made in this area, so far no country in the world has achieved a sustainable economy where high resource productivity and high levels of social and human development are combined with low per capita resource consumption.

In this context, the principles of Green Economy, the new model for economic development aimed at achieving improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities¹, spread worldwide and are more and more considered the only possible and practicable solution to the today's multiple-faced world crisis. **United Nation Conference on Sustainable Development (Rio+20)** in 2012 confirmed in fact that Green Economy, which integrates previous economic, environmental and social pillars with the concept of an *inclusive economy*², can be an alternative pathway that can deliver greater economic opportunities and social justice for disadvantaged groups. Also in the case of the "smart cities" concept it has been agreed that it makes no sense to build ecological houses or even zero consumption ones, if the city neighbourhood and the surrounding environment still remain polluted without green areas and any traffic solution.

¹ UNEP, United Nations Environmental Program, 2011

² UNIDO, UN Industrial Development Organization, 2012

It is easy to transfer these considerations to Industrial Areas: it makes no sense to invest only on the single small enterprise and neglect the scale economies and the possible efficiency increase that can be obtained by joint Area infrastructures and services.

Sustainable Industrial Areas (SIAs)³ have been confirmed as the most favourable contest to implement and test Industrial Ecology principles and tools due to the possibility of not only sharing infrastructures and services for increasing the production and minimize costs, but also:

- 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;
- reduce environmental impacts caused by the industries concentration;
- aggregate the demand of technological innovation and transfer related to environmental, energy and water resources.

MEID (Mediterranean Eco-Industrial Development) Project, funded by the MED Program, had the aim of defining a management model for planning and managing Sustainable Industrial Areas. This tool can be applied – in a standard way – to the areas in all the member countries partners of the project (Italy, Lead partner, Spain, France, Greece, Malta and Bosnia Herzegovina) as:

- a decision support tool for Industrial Area managers,
- a reference model for the Local Authorities integrating industrial policies with efficient use of energy and resources themes.

The project has developed and capitalized some tools and good practices, a so-called toolkit, supporting enterprises and public administration: a procedure to apply the MEID management model to new, structured and non-structured IAs; a database of good practices for Mediterranean IAs; a Guide for the Construction of Environmentally Sustainable Industrial Buildings; examples of positive actions for the Public Local Administrations; a database of environmental friendly technologies for enterprises; a tool for their energy efficiency self assessment.

The book describes the experience done in the project and the developed tools giving also examples of good practices in Mediterranean Industrial Areas.

³This acronym includes all the Industrial Areas satisfying fundamental requirements specified in the MEID management model

1. Strengths and opportunities of Mediterranean Industrial Areas

To understand the successful elements that can contribute to develop sustainable industrial settlements and, in the same time, the barriers or obstacles that have to be overcome, key strategic information has been collected in MEID associated countries and analysed by a **SWOT (Strengths – Weaknesses – Opportunities - Threats) analysis**. This analysis points out the internal conditions (strengths and weaknesses) of an Industrial Area, thus, the aspects that can be influenced directly from internal organizations; and the external factors (opportunities and threats) that are not influenced by the Industrial Area, but still are very important for its performance.

SWOT ANALYSIS		Internal analysis	
		Strengths	Weaknesses
External analysis	Opportunities	How do I use these strengths to take advantage of these opportunities?	How do I overcome the weaknesses that prevent me taking advantage of these opportunities?
	Threats	How do I use my strengths to reduce the likelihood and impacts of these threats?	How do I overcome these weaknesses that will make these threats a reality?

Figure 1.1 - The approach of the SWOT Analysis

The analysis has been conducted taking into consideration the three pillars of sustainability: i) environmental, ii) economical and iii) social.

A questionnaire has been therefore prepared with the aim to:

- identify the “state-of-the-art” of the SIA concept;
- detect risks and difficulties in the implementation of a SIA model;
- determine the best experiences or Best Practices for SIAs in the partner countries.

The questionnaire has been divided in four sections:

1. Legislation
2. Rules for Industrial Areas planning
3. Environmental Management of the Industrial Areas
4. Infrastructures and centralized services

and administered by each MEID partner to relevant national stakeholders in order to gather the required data.

The analysis confirmed, as first finding, the *convergence of the Industrial Area conditions and profiles in the examined Mediterranean countries*. In fact, despite the large variability of industrial settlements in Mediterranean countries, some common elements, such as the large prevalence of SMEs, the similarities of environmental problems faced by enterprises and the common legislative background (European Directives) can be identified. This finding gives the possibility to draw common guidelines for a sustainable management of the Industrial Areas. Hereafter the main results of the SWOT analysis are presented.

1. Legislation

Legislation concerning IAs, 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 IA in all the countries, a specific law concerning Sustainable Industrial Areas is only present in Italy. Here the concept has been introduced by Bassanini law (decree law 112/98) which delegates to the Regions the detailed regulation on the *Ecologically Equipped Industrial Areas* (in Italian *Aree Produttive Ecologicamente Attrezzate, APEA*) but still, it gives some basic reference elements such as quality infrastructures and systems and unitary management of the infrastructures and services.

Another interesting approach which has some valuable applicative experience on the environmental side is the “**EMAS APO**” (Ambito Produttivo Omogeneo, Homogeneous Production Areas) registration. It is ruled by a technical document of the Italian Ecolabel-Ecoaudit Committee which has the objective to promote the environmental improvement not only at a firm level but also at territorial level (more details are shown in Section 4.3).

In France there can be mentioned the national initiative named “**Grenelle de l’Environment**” which was organized in order to take long-term decisions regarding environmental issues and sustainable development, to restore biodiversity and other related issues.

Other initiatives are mostly regional such as the ones in Basque Country and Valencia Region in Spain (see Section 4.3). Recently a new promising law entered into force in Greece. Bosnia Herzegovina decided to put the unitary management

of new IAs in the Action Plan for Strategic Planning of Zenica-Doboj Canton.

Moreover Greece and Italy have public-private organizations (in Italy named “Consorti ed Enti di industrializzazione”), created in the decade after world War 2 to support industrialization of depressed areas, which still manage important Industrial Areas in a unitary way and that can still be a very important element to boost the sustainable management of IAs.

2. Rules for Industrial Areas planning

Industrial Areas in the Mediterranean region are located and planned by urban means which are developed on local or regional level depending on the country, the extension of the area and other specific characteristics. Urban tools specify that procedure of selection of the site should take in account the infrastructures location, proximity to residential areas, previous existence of industrial premises or the environmental impact generated.

Still, they lack many elements that could be helpful for the sustainable management of IAs such as forums with stakeholders and a systematic consideration of the future clients prospects in the definition of the building characteristics or of area services.

3. Environmental Management of the Industrial Areas

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. 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.

4. Infrastructures and centralized services

The most widespread infrastructures and centralized services assessed in the studied areas are reported in Section 4.1. While the environmental practices are quite widespread, it is evident that social ones are still weak, and that few common actions are foreseen on the economic aspects.

Conclusions and recommendations

The SWOT Analysis has pointed out the fragile introduction of the concept of

sustainability in the IAs of the partnership countries. Despite the examined areas are the most evolved ones in this perspective, they still lack important interventions and systematic integration of this concept into their daily working activities. The process of conversion of IAs into Sustainable ones is in fact still in the beginning, and to date no area has completed the transformation. Nonetheless, this analysis shows that the path to sustainability has begun and many actions and problems that sustainability addresses have been faced and taken in consideration.

In the regions where a legislation on more environmentally friendly Industrial Areas exists, IAs have a great opportunity to take advantage of it and accelerate their conversion. Still, it remains a slow process in these regions as well, also due to the lack of economic incentives and significant regulation relief. A careful consideration in this direction should be done by Local Authorities, which can greatly influence this conversion. In Section 4.3 of this report a list of good practices adopted by Local Authorities in Mediterranean regions to foster IAs conversion and support cooperation among enterprises is given.

Essential References

- * Deliverable 3.2.4 MEID Project. SWOT Analysis report: the case of the Industrial Areas of Mediterranean countries. November 2011.
- * Deliverable 3.2.1 MEID Project. Report for territorial analysis. November 2011
- * Hill, T. & R. Westbrook. SWOT Analysis: It's Time for a Product Recall. Long Range Planning 30: 46–52.

2. The International Background of MEID model

The awareness that a systemic approach, extended over a whole IA, can ensure a more efficient use of resources, combining the needs of the companies and improving their economic performance, has been concretely developing in the past decade at the international level, also thanks to the development of environmental management tools extended to wider contexts, such as Local Authorities and industrial districts.

The development of Eco-Industrial Parks (EIPs) has been a practical strategy to implement the concept of Industrial Ecology through the collaboration among companies and the demonstration of the synergy between environmental performances and economic competitiveness. According to a definition that has encountered wide acceptance among the experts, “the goal of an EIP is to improve the economic performance of the participating companies while minimizing their environmental impacts. Components of this approach include green design of park infrastructure and plants; cleaner production, pollution prevention; energy efficiency; and inter-company partnering. An EIP also seeks benefits for neighbouring communities to assure that the net impact of its development is positive”.

MEID model has been built on this background and on several international experiences carried out in Mediterranean countries on the theme of Clusters/Industrial Areas management.

Life project SIAM (Sustainable Industrial Areas Management, (<http://www.life-siam.bologna.enea.it>), for instance, coordinated by ENEA and concluded in 2007, developed and tested the management model which is the basis of the MEID one in eight Italian Industrial Areas.

Italian legislation (Decree Law 112/98, so-called “Bassanini Law” and, just to cite one of several Regional laws, Emilia-Romagna Region Law 20/2000) defined the requisites of *Ecologically Equipped Industrial Areas*, characterized by unitary management, shared infrastructures and innovative services in order to minimize and manage the pressure on the environment in an integrated way.

Life project Eccelsa (Environmental Compliance based on Cluster Experiences and Local SME-oriented Approaches, <http://www.eccelsalife.it>) defined and applied the “cluster approach” methodology (based on the establishment of a network among SMEs and other partners for resources’ sharing, innovation develop-

ment, knowledge exchange, better dialogue on the local level) with the aim of creating solutions for a cooperative management, supporting SMEs to achieve environmental compliance and filling the gap of the awareness of the SMEs about the environmental regulations applicable to them.

Managing the Industrial Territories in The Knowledge Era project (**MITKE**, INTERREG IVC Programme, <http://www.mitke.eu>) had the main objective to provide a platform and mechanisms for collection, exchange and transfer of good management practices of Business Areas and Industrial Parks (BAIPs) among regions in Europe.

Ecomark project (MED program, www.ecomarkproject.eu) aimed at developing Green Marketing specifically for Eco-Industrial Parks and generally for IA, with the objective of enhancing the competitiveness of SMEs and contribute to a more sustainable community development. The Green Marketing principle is based on sustainable products, processes and services, and is oriented towards the external communication. The project is focused on applying two innovative services (Sustainable Logistics and Third Party Financing Mechanisms) and developing green marketing plan.

The Remaking Competitive Places for 21st Century Businesses (**RCP21**, <http://rcp21.com>) was a 2 year (2009-11) project to transfer good practices, and know-how to local authorities and other key stakeholders, and to assist them to maximize the benefits and added value of their business and industrial parks.

MEID project has tried to capitalize the knowledge developed by all these projects, and, where possible and feasible, to build up transnational cooperation by jointly organizing dissemination events, or inviting relevant speakers to MEID events. Traces of this effort can be found throughout the MEID work.

3. The MEID model paths

Mediterranean Industrial Areas are very diversified in relation to size, number of settled enterprises, specialization, stage of development, organization, environmental and economic impact on the surrounding territory. To try to generalize the applicability of the management model to different typologies of Industrial Areas, MEID developed **three specific paths**: for new IAs, for Areas not managed at all (non structured, the large majority of IAs in Mediterranean countries) and for structured IAs (which are already managed, at least for some aspects).

3.1 New Industrial Areas

The first path of the MEID model describes the steps that have to be pursued during the planning and the design phase of a new Industrial Area.

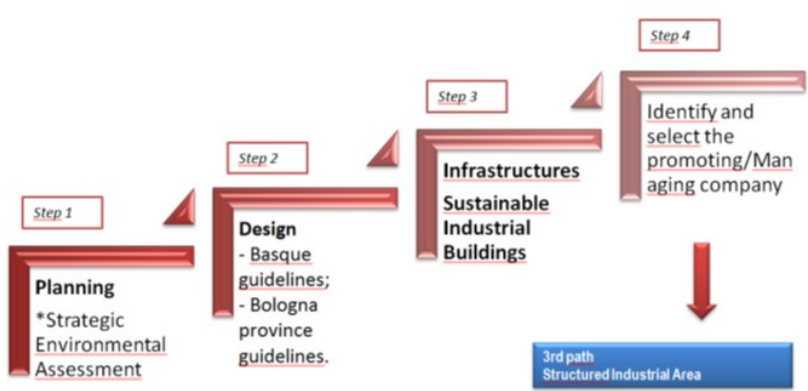


Figure 3.1 - Planning and Design steps for new Industrial Areas

In the *planning* phase of a new IA, different choices and scenarios have to be considered which have also to deal with the related environmental impacts. On this purpose, the MEID procedure identifies *Strategic Environmental Assessment (SEA)* [step 1] as the main tool for the environmental assessment.

There are two reference tools for the *design* of new Industrial Areas: the *Basque Guidelines for the sustainable development of urban projects* realized by the Sprilur Group of the Basque Region and the *Bologna Province Guidelines for the realization of Ecologically Equipped Productive Areas* [step 2].

For the Industrial Buildings design, the reference document is the Guide for the Construction of Environmentally Sustainable Industrial Buildings, defined within

the MEID project [step 3]. The path finishes with the individuation of the Promoting Company of the Industrial Area [step 4] which has to be involved in the previous steps and consequently, start the implementation phase of the MEID essential requisites (path 3).

Step 1



Strategic Environmental Assessment (SEA)

Strategic Environmental Assessment (SEA), ruled by 2001/42/CE Directive, is the main tool that can ensure a high level of protection of the environment in the phase of drafting, adoption and approval of plans and programs. The first step of this path aims at the implementation of the methodological elements of the SEA in order to address the design of a new Industrial Area following the MEID model.

The main elements of SEA can be summarized as follows:

- Elaboration of the Environmental Report:
 - environmental, territorial and socio-economic analysis of the chosen area;
 - assessment of the coherence of the project with the guidelines defined by the existing design tools;
 - set up of different alternatives and estimation of the effects with the application of the indicators;
 - comparison among alternatives and evaluation;
 - identification of mitigation measures and compensation;
 - elaboration of monitoring plan: definition of indicators, agenda of activities.
- Consultation with stakeholders in order to give them the opportunity to outline their observations and provide new elements in the knowledge and evaluation process.

The previous steps allow to consider in a very early phase the environmental characteristics of the areas involved in the intervention and to assess the environmental effects which follow the realization of an Industrial Area. In this way it is also possible to define the measures which have to be undertaken for preventing, reducing or compensating eventual negative impacts on the environment.

Step 2



Guidelines for designing new IAs

Two of the most interesting guidelines for designing new Industrial Areas are described hereafter. Bologna Province guidelines details the requirements that a

productive settlement should follow in order to become an ecologically equipped one. This Guide is a reference document for the management of Sustainable Industrial Areas and has been prepared in the framework of a qualification process of the productive settlements that the Bologna Province has started. It is a tool for local administration, designers and entrepreneurs involved in the qualification process. This tool has the following contents:

- defines which are the performance objectives to pursue;
- indicates the criteria to follow and suggests the main actions to undertake in the urban, environmental and building design (as a result, an urban plan in a correct territorial layout and proper technical standards are set);
- indicates which are the main procedures and actions in order to effectively realize a unitary management for the whole area.

Following these indications, it is possible to assess and certify the Ecologically Equipped Industrial Area qualification.

The *Basque Guidelines to sustainable development for urban planning projects* developed by Sprilur Group is a tool for the urban design which assesses the level of sustainability of the design, realization and the maintenance of a project of urban transformation. The Guide wants to give to the technicians involved in the development and the realization of urban and industrial development projects, a set of recommendations and tools which can improve the sustainability of the project. This tool integrates and does not substitute other existing instruments at a State level of MED area related to the measurement of environmental sustainability applicable to the planning phase of the IAs.

The Guide contains a rating system for each dimension of environmental impact. The different impact dimensions are then weighted on the basis of the level in which the proposed project could impact on different areas.

Step 3



MEID Guide for the Construction of Environmentally Sustainable Industrial Buildings

Industrial buildings are an important part of the IAs infrastructures, as they can have important impacts on the use of resources in the area and on the wellbeing of workers. A Guide for the Construction of Environmentally Sustainable Industrial Buildings has been developed in MEID project building upon a previous Guide developed by Sprilur (<http://www.sprilur.es/?lang=en>) and Ihobe (<http://>

Aim of this Guide is to present a series of recommendations to the different actors involved in the process of design, construction and maintenance of a specific construction project, regarding the environmentally sustainable perspective. A wider description of the report can be found in Section 4.2.

Step 4

⇒ Promoting Company

In the phase of the planning and design of an Industrial Area it is not requested the presence of a Managing Company. Instead, a Promoting Company should be present in order to participate and give a direction to this process. The Promoting Company will be directly involved in the consultations with stakeholders in order to gather their observations and provide new or further elements of knowledge and evaluation in this process.

Once the planning and the design phase has been concluded, the Promoting Company can manage also the following phase of settlement or management of the area or can only participate at identifying the Organization that will realize the steps identified in the path 3 of this procedure.

Essential References

- * Deliverable 4.2.4 MEID Project. MEID Procedural Model. February 2012;
- * Bologna Province Guidelines: http://www.provincia.bologna.it/impresa/Engine/RAServeFile.php/f/APEA/Linee_guida_APEA_Ott2008.pdf;
- * Map of the Ecologically Equipped Productive Areas of Emilia - Romagna Region: http://atlante.ervet.it/apa/main_login_page.php;
- * Basque Guidelines to sustainable development for urban planning projects, SPRILUR Group: http://www.basqueresearch.com/berria_irakurri.asp?Berri_Kod=2691&hizk=I#.UWK6-sqSkik.

Examples of good practices

Strategic Environmental Assessment (SEA), which is regulated by Directive 2001/42/EC, is the main tool to ensure a high level of environmental protection for the preparation, adoption and approval of public plans and programs. The use of this procedure in the design of a new Industrial Area ensures that the environmental effects of decisions are taken into account before the decisions are made. The SEA methodology contributes to the integration of environmental considerations in the preparation of projects and, also, ensures public participation in decision-making and thereby strengthens the quality of decisions. There are many cases in which new Industrial Areas programs have gone under this evaluation methodology leading to more effective decisions from the environmental point of view.

For example, in 2011, the **Municipality of Massa Marittima** submitted to the **SEA** process the Plan for industrial sites (PIP "Piano per insediamenti industriali") before its final approval. The main goals and actions foreseen in the Plan have been evaluated on the basis of consistency with local and higher-level planning tools and of the significance of potential impacts on the most significant impact categories, such as landscape and territorial effect (which includes soil use and visual impact, water supply and wastewater treatment, noise, dust and traffic), economic and social effect, human health, quality of the landscape and natural heritage. The assessment, which has been shared with stakeholders, proved the effectiveness of the planned actions and imposed to integrate the Plan with further mitigation measures. More information on: <http://www.comune.massamarittima.gr.it/default.asp?idm=77> (in Italian). A discussion on strength and weaknesses of SEA process and of the impacts considered in some SEA applications can be found at http://www.ivm.vu.nl/en/Images/tool_chappdf.31_tcm53-163503.pdf.

Another example of SEA applied to a project of an Eco-industrial Area is the one relating to the **APEA Marconi** in Emilia Romagna Region. For more details see the following web site: http://www.comune.fidenza.pr.it/index.php?option=com_content&view=article&id=2617:rapporto-ambientale&catid=111:servizio-ambiente-e-protezione-civile&Itemid=283 (in Italian).

3.2 Non structured Industrial Areas

The second path of the MEID procedure describes the steps that an Industrial Area, which is not managed at all but wants to be pro-active, needs to carry out to apply the MEID model approach. Despite the approach is mainly based on private initiative, the promotion of these actions by the Local Authorities is the best way to start-up the process in all Mediterranean countries.

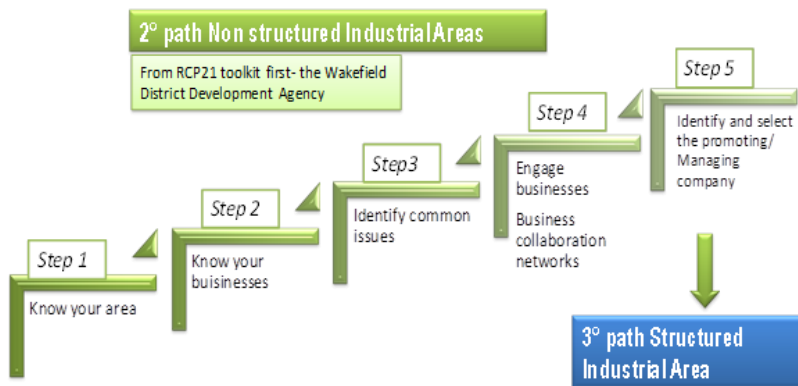


Figure 3.2 - Step of non structured Industrial Area

Step 1 → Know the Industrial Area

Knowing the IA and its actors is the first step to implement any managing process. At an operational level it is necessary to create a map that helps to quickly locate and identify the settled companies and the free areas including the internal road network. The mapping of the IA is the first step to encourage the collaboration among the companies that will feel part of a group and not isolated entities.

As specified in the document “Remaking Competitive Places for 21st Century Businesses” (RCP21), the operational phases to know the IA area are:

- define the boundaries of the IA;
- map the road network;
- identify the Areas not divided into plots and their property;
- do a check to identify and map the companies;
- gather the data of each company (name, address, activity);

- create a complete map of the park;
- create a register for the companies.

Step 2



Know the businesses

Knowing the activities of the settled companies means promoting the growth and the sustainability of the area. Local Authorities, Development Agencies and the companies can use the gathered information for a proactive economic development. Knowing the economic activities of the Industrial Area helps to realize actions with joint objectives, sharing resources and expertise.

The operational phases to know the IA are:

- establish strategic alliances with key companies of the Area;
- connect to other company networks;
- assess the economic development of the Area as a basis to define new objectives;
- identify the needs of the companies;
- follow an objective at a time;
- guarantee rapidity in the responses to companies.

Step 3



Identify common objectives

The collaboration among companies is a fundamental step to move forward sustainable development of IAs. It is very important to:

- identify common objectives (environmental, social and economic);
- choose priority objectives according to the needs of the companies;
- define actions to solve the selected objectives.

The identified initial joint actions should be simple, cost-effective and really focused on the need of the companies, as they are crucial to build-up a climate of cooperation among the settled enterprises.

Step 4**Promote Business networks**

A Business Collaboration Network (BCN) is a business – led group of businesses and other agencies that have a shared interest in working collectively to address particular issues, problems or joint needs of the businesses located on the park.

Often, the facilitator is funded publicly and the role is to bring the businesses together to meet, identify the key issue and pinpoint solutions. The facilitator may also assist in sourcing funding for any proposed project or work with the businesses, including organizing any shared funding or resources between the businesses.

In case there is the need to formalize the collaboration among companies, the tool of network contract can be adopted (it is regulated in Italy by the Law 122 of 2010). The company Networks Contracts (NCs) in Italy is also a way to obtain:

- Regulation and fiscal relief;
- National and regional incentives;
- Financial support;

More information on Network Contracts in Section 4.3.

Step 5**Identify the Promoting Company**

The path is closed when the Promoting Company of the area is identified.

The Promoting Company can propose itself as Managing Company or can finish its role as soon as the Managing Company is organized and operative.

Example of good practices

Coca Cola Enterprises led the setting up and running of a Transport BCN in the Wakefield 41 Industrial Park (UK) (<http://www.yhbip.com/en/text/transport/Transport>). At a scheduled meeting between the company and first the Wakefield District Development Agency, a public - private partnership created to foster the economic development in the District, the Operations Director explained that Coca Cola planned to increase the size of their vehicle fleet expressing concern that if other business on the park had similar plans to increase their fleets of heavy goods vehicles the parks road network may become gridlocked. It was agreed that it would be beneficial to bring together the businesses on the park which also operate large fleets of vehicles to discuss this issue. The most appropriate businesses on the park were identified and invited to a meeting to discuss the transport issue. It was quickly established by the companies present that there was not going to be a problem with the volume of traffic entering and leaving the park. However businesses did identify over 40 common areas that they could collaborate on for mutual benefit, such as:

- inter-trading opportunities;
- warehouse utilization;
- beating snow and icy roads;
- traffic improvements;
- training and employment.

3.3 Structured Industrial Areas

Path 3 follows at a conceptual level the previous paths: in the case of a new Industrial Area it follows the phase of the planning and design, and in the case of an existing non structured area, the phase of knowing the area and the collaboration of the enterprises which is compulsory for the full application of the MEID model. In this path it is more appropriate to talk about elements of the model and not steps as they can be applied without a chronological progression.

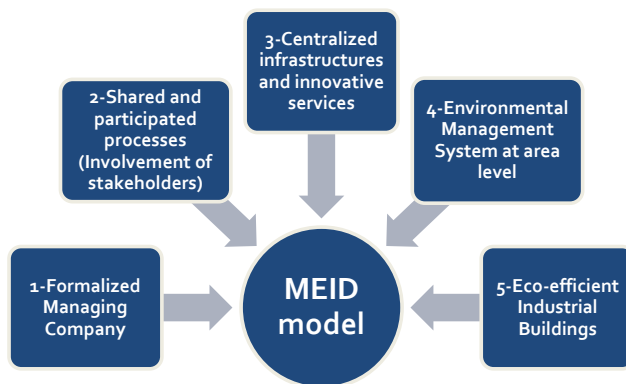


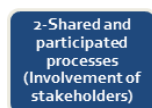
Figure 3.3 - Elements of structured Industrial Areas



Managing Company

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 IA and guarantee 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.

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 all requisites of the MEID model. The Local Committee is not necessary in case the Managing Company is a mixed private/public organization.



The participated processes

An **advisory forum** which should be composed by representatives of the companies, Local Authorities, category associations and general stakeholders, should be organized and coordinated by the Managing Company. The forum allows to gath-

er 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.

3-Centralized
infrastructures
and innovative
services

Centralized infrastructures and innovative services

Following the phase of the analysis of the needs, the IA should be equipped with centralized state-of-art plants, able to exploit economies of scale and innovative services for the management of environmental, economic and social aspects. Services and infrastructures can be managed directly or through third parts by the Managing Company which, in any case, will have to ensure the quality of the delivered services.

4-Environmental
Management
System at area
level

Environmental Management System of the Area

The Industrial Area by its the 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.

5-Eco-efficient
Industrial
Buildings

Eco-efficient Industrial Buildings (SIB)

As for the step 3 of the first path, the MEID Guide for the Construction of Environmentally Sustainable Industrial Buildings is the reference document for the MEID model (see Section 4.2).

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4. The MEID toolkit

In the following sections a **collection of tools** for IAs managers, Local Authorities and SMEs is presented. The aim of these tools is to support the different actors of IAs to apply the MEID model concepts. These tools have been mainly developed in the MEID project or by MEID partners in different projects.

4.1 Database of good practices in the Mediterranean Industrial Areas

A **database of good practices** to be applied in IAs of the Mediterranean Region has been developed in MEID project. The concept of good practices is to be intended in its wide meaning, as it includes techniques, technologies as well as management practices. The database is organized in folders, one for each IA, and it contains the following information:

Information on the IA

- Name of the IA
- Country and geographic area
- Managing Body
- Number of involved Municipalities
- IA surface
- Number of established companies and employees
- EMAS or ISO14001 certification
- Contact information (web site, email and postal address)
- Documentation of the IA (pdf)

Information on its good practices

- Environmental aspects
- Social aspects
- Economical aspects

It contains 46 folders, related to the MEID partner's countries. Table 4.1 shows the distribution per country, while Table 4.2 presents the collected good practices classified in macro categories (Environmental, Social and Economic).

Country	No. of IAs
Bosnia and Herzegovina	2
France	7
Greece	11
Malta	2
Spain	11
Italy	13
TOTAL	46

Table 4.1 - Distribution of good practices per country

Good practices	No. of IAs
Environmental	87
Social	45
Economical	13
TOTAL	145

Table 4.2 - Distribution of good practices per macro categories

The following tables give examples of the collected practices.

- Economical** market analysis and evaluation of the best investments for businesses, to support and promote business relations with local stakeholders, ...;
- Social** kindergartens, roads, banks, post offices, hotels, restaurants and canteens, services centres, conference rooms, fibre optic and wireless internet connection, social security, ...;
- Environmental**
- energy (energy production and area lighting from photovoltaic systems, energy production from biomass, ...);
 - water (wastewater plant, water recycling plant and water reuse for industrial purposes, fire and irrigation systems, ...);
 - waste (waste management, differentiated door to door waste collection system, ...);
 - Industrial Area and landscape architecture (green areas, integration of Industrial Area in the landscape, ...);
 - buildings;
 - environmental monitoring (emissions monitoring, ...);
 - mobility (Mobility Manager, public transport (bus and light rail tram), car sharing, cycle tracks, ...);
 - product policy (to support environmental product labels, Life Cycle Assessment methodology and studies, ...),
 - research programs.

Table 4.3 - Examples of collected good practices

Table 4.4 presents the most widespread ones:

Environmental good practices		No. of IAs
Waste	Door-to-door waste collection	4
	Material recovery plant	3
Mobility	Car pooling or car sharing	4
	Bikeway	3
Energy	Energy recovery plant using biomass	5
	Photocell panels (for illumination plant or production of electricity)	4
Water	Wastewater treatment plant or recycling of discharged water	19
	Rainwater collection	4
Environmental monitoring	Environmental monitoring of the IA	5
Social good practices		No. of IAs
Inter-company nursery		5
Fibre optics and/or Wi-Fi telematic network		5
Services centre (post offices, banks, hotel, restaurants, superettes, ...)		4
Roads (motorway, railway)		4
Food services (restaurant, cafeteria, area canteen, ...)		10
Hotels and accommodations		3

Table 4.4 - Widespread good practices in IAs of Mediterranean countries

Entering the database, it is possible to search for information on IAs or on specific good practices through a specific search menu, selecting key parameters as IA surface, number of firms, macro category (environmental, social or economical) or, for the environmental ones, sub-category (mobility, waste, water and so on). Otherwise, without any searching, it is possible to view the full list of the available folders. An essential bibliography (a collection of websites addresses as well as documents and deliverables on best practices in Italian and European Industrial Areas) called "Document Repository" is also included in the database.

The database is available on the MEID project website, at <http://www.medmeid.eu/the-project/results-and-deliverables/bat-database>. It is accessible by providing a username and a password to the system which can be obtained by performing a regular and free registration. The following figure shows an example of information included in the database.

Managing body	Macrolotto Services Consortium of Prato (CONSER)
Number of municipality	1
Surface(kmq)	1,4
Number of firms	360
Number of employees	3500
Main industrial vocation	Textile
Number of EMAS or ISO14001 certification firms	10
Note	SIAMProject participation: www.life-siam-bologna.enea.it
Consortium	Macrolotto Services Consortium of Prato (CONSER)
Web site	CONSER
Area Documentation	I Macrolotto Industrial Area Documentation
Area Documentation2	Centralized services of I Macrolotto
Contact	CONSER 59100 PRATO - Via Toscana, 6/B Tel. +390574730305
Mail Contact	info@serviziailleimprese.eu


Macro Category	Environmental
Category	Water
Infrastructure-services	Plants for recycling of discharged water
Benefits	Recycling of discharged water and reuse for industrial and fireproof purpose
Download Documentation (pdf)	Plants for recycling of discharged water
img1	
	Plants for recycling of discharged water

Figure 4.1 - Example of information for a specific Industrial Area

4.2 MEID Guide for the Construction of Environmentally Sustainable Industrial Buildings

The aim of this **Guide** is to present a series of recommendations for the construction of **Environmentally Sustainable Industrial Buildings** to the different actors involved in the process of design, construction and maintenance of a specific construction project. This document has as “starting point” a similar guide, “Guía de Edificación Ambientalmente Sostenible en Edificios industriales en la Comunidad Autónoma del País Vasco”, elaborated in the Basque Country by IHOBE, S.A.⁴ and SPRILUR, S.A.⁵. Within the context of MEID project, a summarized version of that guide has been adapted to the peculiarities of the Mediterranean IAs thanks to a team of experts of the MEID partners. Analytical Hierarchical Process was used to collect and analyse the expert’s responses.

A wide list (88 measures) of good practices applicable to the construction of buildings and industrial sites throughout all their lifecycle (covering construction materials, as well as the construction process and issues related to energy consumption and other natural resources that are associated to the use of the building) are described. The measures contribute to make industrial buildings environmentally sustainable, without affecting their quality, nor entailing loss of performances or functionalities for the final user.

This guide is not intended to be a detailed engineering or architectural treaty on the incorporation of specific measures in the field of construction. The adoption of a specific method of calculation or evaluation system is therefore not imposed, allowing the user to select the methods, tools and instruments that best comply with the recommendations described under this guide.

As regards the configuration of this Guide, each one of the “good practices” is described in specific data cards. Each data card contains the following sections:

- Code and heading;
- Maximum rating;
- Description;
- Field of application;
- Technical considerations and implications;
- Environmental impact of the measure;

⁴ Ihobe, <http://www.ihobe.net>

⁵ Sprilur, <http://www.sprilur.es>

- Related measures;
- Quantification of the measure;
- Requirements for demonstrating compliance with the measure.

In particular, this last section indicates the documents that have to be provided in order to demonstrate the compliance of the measure described under each data card. Measures can be verified at two different stages: construction project and work completion.

The proposed measures have more or less impact on one or several areas of action. A score on a scale of 0-5 has been assigned to each measure in each category or area of environmental action. Depending on the measures to be applied and those which may be applicable in each area, an environmental score associated to each area of action will be obtained. This value will be multiplied by a weighting factor (depending on each area) to obtain a weighted value. The sum of all weighted values will indicate the score obtained by the building.

AREA OF ACTION	WEIGHTING FACTOR		DEFINITION
MATERIALS	Fp1	0,19	Reduced consumption of non-renewable raw materials
ENERGY	Fp2	0,30	Reduced consumption of energy and/or generation of energy based on non-renewable sources
DRINKING WATER	Fp3	0,06	Reduced consumption of drinking water
GREYWATER	Fp4	0,05	Reduced generation of greywater
ATMOSPHERE	Fp5	0,03	Reduced emission of gases, dust, heat and luminous energy
INDOOR AIR QUALITY/ COMFORT/HEALTH	Fp6	0,05	Improved quality of interior air, comfort and health
WASTE	Fp7	0,08	Reduced generation of solid waste
LAND USE	Fp8	0,03	Reduced land occupation
MOBILITY AND TRANSPORT	Fp9	0,12	Reduced transport processes and improved personal mobility
ECOSYSTEMS	Fp10	0,09	Improved operation of natural areas and increased biodiversity

Figure 4.2 - Areas of action and related weighting factors

The Guide can be download here: http://www.medmeid.eu/wp-content/uploads/2013/01/MEID_guide_electronic.pdf

4.3 Good practices for Local Authorities

These section contain a description of some **good practices (laws, norms) adopted in European Countries** that can be applied by Local Authorities to foster the transition of IAs to more sustainable ones. It is a primary role of Public Bodies to create the opportunities for enterprises to move towards a more resource efficient approach. Each law or norm should be integrated in the national/ regional context.

Grenelle de l'Environnement - National initiative for Sustainable Development - France

The **Grenelle de l'Environnement** is a series of political meetings organized in France in October 2007, to take long-term decisions regarding environmental issues and sustainable development, particularly to restore biodiversity, and Regional patterns of ecological coherence, while reducing emissions of greenhouse gases and improving energy efficiency. One of the ideas is to impose to any new Areas for Joint Development Zones (ZAC), a preparatory study of feasibility of creation of a heat virtuous network or the extension of an existing network. This feasibility should be understood in terms of energy service availability and crossed with the expected building performance. In order to facilitate assessment of the feasibility and virtuous character of the solution, it seems necessary to impose criteria and thresholds, such as housing cost, the cost per ton of CO₂ avoided, thermal density, etc.

The goal is to balance energy production with French backing the centralized network systems to more decentralized autonomy. It is also further reduce the carbon content of the French energy supply, and as a first step to achieve the target of 20% (or 25%) of renewable energy (final) in 2020, good environmental conditions and feasibility. This implies an increase of 20 million TEP from renewable in the energy mix in 2020, following two strategic lines, empowerment and decentralization, where possible.

Achieving urban areas or industrial use is an opportunity to consider the creation or development of large-scale district heating networks. Overall, the Grenelle Law made a big change in the consideration of environmental aspects for new constructions. It pays attention to ecological and sustainability aspects, improve the awareness and propose some incentives to IAs and companies to integrate eco-friendly solutions.

Business Improvement Districts (BID) - United Kingdom, Germany, USA

A **Business Improvement Districts (BID)** is a defined area within which businesses pay an additional tax or fee in order to fund improvements within the district's boundaries. Grant funds acquired by the city for special programs and/or incentives such as tax abatements can be made available to assist businesses or to recruit new business. The process for creating a BID varies from one jurisdiction to another, but generally three steps are involved. First, some number of businesses in the area petition the local government to create the BID. Second, the local government determines that a majority of businesses want the BID. Third, the local government enacts legislation creating the BID. Prior to this occurring, state legislatures need to grant local units the authority to create BIDs.

A BID may be operated by a nonprofit organization or by a quasi-governmental entity. The governance of a BID is the responsibility of a board composed of some combination of property owners, businesses, and government officials. The management of a BID is the job of a paid administrator, usually occupying the position of an executive director of a management company. BIDs are viewed by many businesses as a fair and affordable way of creating a fund for up to 5 years that is "managed by business for business".

The aim of a BID can be the revitalization or a way to add value to a specific area. The initial actions included in a BID agenda are in general targeted to specific issues of the industrial park: cleaning of roads, reduction of crime, abatement of carbon emissions or energy costs. Once a climate of mutual confidence among enterprises has been created, more complex action can be introduced.

There are now 130 approved UK BIDs. Six of the sixteen German Bundeslander (Federal States) introduced the requisite legal framework to create BIDs: Hamburg, Bremen, Hessen, North Rhine-Westphalia, Saarland and Schleswig-Holstein. BID projects in implementation exist only in a few German cities, yet - e.g. in Flensburg, Hamburg and Giessen. Moreover, there are nearly 1000 BIDs in the USA.

Some good examples of successful BIDS, developed in the project RCP21 can be found on <http://rcp21.com/success-stories/>.

Network contracts (NCs) among enterprises - Italy

Network Contracts (NCs) have been introduced in Italy by Law n. 122, July 30th 2010. It is an agreement with which a number of entrepreneurs collaborate to increase their own innovation skills and their competitiveness on the market, exchanging information or industrial, commercial or technological services and experiencing activities related to the object of their own enterprise. The possible activities range from the sharing of production stages to the development of common R&D and international projects. Such agreements, which make company networking possible without affecting ownership status, are becoming popular in the manufacturing industry. They are a way to overcome the problem of inadequate dimensions and niche and fragmented production of SMEs, allowing to show as a single interlocutor to compete on international markets with the proper critical mass and completeness of activities. NCs can be used in IAs to establish business networks among firms. NCs are associated to **tax incentives**, allowing companies to suspend payment of certain taxes. The tax to be paid on any earnings set aside by the network of companies for its investments can be suspended for the duration of the agreement. An example is **Infrabuild** (Varese area), a network of ten Lombard businesses which supply products and service for infrastructures and sustainable mobility (<http://www.infra-build.it>). The network mission is:

- make associated companies stronger and more competitive, working as a united group to increase the value of their competences;
- make the production system stronger and more competitive, increasing its international visibility, the knowledge of the markets, organizing competences and teamwork ability.
- take advantage of the synergies among the worlds of constructions, companies, research, centers of excellence to create an area of excellence connected to the infrastructure, construction and green mobility fields.

Possible environmental benefits related to Infrabuild NC are:

- sharing of R&D costs of eco friendly products and services;
- environmental improvement of production processes;
- reduced environmental impact related to the supply chain and logistics.

Legislation on APEA (Italian acronym for “Ecologically Equipped Productive Areas”) – Emilia-Romagna Region, Italy

APEA (Italian acronym for *Ecologically Equipped Productive Areas*) have been introduced in Italy thanks to the decree law 112/98. The article 26 assigns to the Regions the duty to detail, so that they can be equipped with “necessary infrastructures and systems that can guarantee the health, safety and environmental protection”; it foresees a unitary management of infrastructures and existing services (a characterizing aspect of APEA) and pushes to detect them firstly among already existing areas, zones or productive settlements.

In Emilia-Romagna Region:

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.

In Bologna Province:

Bologna Province has included the theme of APEA in its territorial governance tool – Territorial Plan for Province Coordination.

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, 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. Bologna Province guidelines are an operational tool that:

- defines the organizations involved in this process and the path to follow to reach the APEA qualification;
- specifies the minimum performances to reach;
- suggests the main actions in urban, environmental and building design;
- indicates which is the way and the main actions to effectively realize the unitary management for the whole area;
- defines a verification system for the requisites of APEA.

For further details (in Italian):

<http://www.provincia.bologna.it/imprese/Engine/RAServePG.php/P/253411360504/T/Cosa-sono-le-Apea>

Regulation EMAS APO - Ambiti Produttivi Omogenei (Homogeneous Production Areas) - Italy

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.

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 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.

The Industrialdeak Programme - Basque Country, Spain

SPRILUR, a publicly owned company in the Basque Country (Spain) in charge of the management of public industrial land, owns and manages 42 industrial estates. Additionally, SPRILUR is shareholder in 24 companies (majority shareholding in 19 of them) that have developed 67 industrial estates under the so-called Industrialdeak Programme, in close collaboration with Regional Government and other local players.

The **Industrialdeak Programme**, built upon inter-institutional collaboration among the regional and local authorities, was launched in the early eighties with the aim of favoring business activity and improving socioeconomic conditions in the local context. It was oriented to address two major issues, namely lack of surface (high prices, urbanization difficulties) and lack of industrial park management. In its early stages, attention was placed on most deprived areas. Those areas were characterized by fast industrial growth followed by rapid and strong decline which lead to high unemployment rates and highly polluted soil. Urgent environmental regeneration was required so that they could be reindustrialized and host new economic activities. Institutional involvement has been essential for several years, with important resources being allocated, both economic and technical, in their decontamination and revitalization process.

The Programme, rooted in the Basque SME support policy, focuses on providing industrial infrastructures following territorial balance and sustainability criteria, at competitive prices and access to property through flexible financing. The inter-institutional participation of Local Councils and Regional Government, together with SPRILUR, favours the simplification of urban planning negotiations and procedures and, therefore, substantially reduces the economic conditions of the supply of urbanized land and industrial premises. The access to ownership of modular industrial premises is facilitated at a perfectly assumable and non-speculative cost. The chief advantages lies in its financing, through a system of leasing with a purchase option after 9 years. The project is public financed through Share Capital and Bank Loans.

Business Service Centre - Zenica-Doboj Canton, Bosnia and Herzegovina

Business Service Center (BSC) as part of local government closely cooperates with all Ministries and Departments, especially with Ministry of Economy, Spatial Planning, Transport, Communication, Environment, Agriculture, Forestry and Water Management. Business Service Centre has used the skills and capacity gained through the MEID project, as a ground to enhance the capacities and decision tools of Competent Authorities, to integrate environmental friendly solutions into the Cantonal and National Development Strategies. In this context, environmental solutions related to Industrial Policy and sustainable development were integrated into the Action Plans of Strategic Planning in Zenica-Doboj Canton (2011, 2012, 2013) as well as into the Reports on Activities related to implementation of this Action Plan. All these strategic documents were adopted by the Cantonal Government and delivered to Federal Institute for programming of development. The special part of the Action plans regarding "Ecology and development of energy resources" pays attention to ecological and sustainable aspects and gives contribution to some initiatives for IAs and companies to integrate eco-friendly solutions.

The main measures, specific for IAs, have been established in the Action Plans in order to be implemented in the following sectors:

- Management: new IAs should provide unitary management structure and should be managed by unitary management for the whole area;
- Energy: in new IAs the priority will be given to renewable energies as well as environmental improvement of production process;
- Building: actions on environmental/building design should be undertaken;
- Networking: associated companies should act as a system to make companies stronger and more competitive;
- Monitoring system: environmental monitoring system should be defined;
- Legal framework: introduction of the required legal framework harmonized with EU legislation to create the most valuable solutions in the field of ecology and energy efficiency.

The "Decision of the Government of Zenica-Doboj Canton", made by Cantonal Government (July 2012), made a big change in consideration of environmental aspects for new constructions. It pays attention on applying of the principles of energy efficiency in facilities financed by Cantonal budget.

Industrial Policy Strategy 2010-2015, Valencia Region, Spain

Regional Government development strategy of Valencia Region considers industrial development as one of the main ways to recover the competitiveness of regional economy. The **Valencia Region Industrial Policy Strategy 2010-2015 (EPI)** was drafted to boost Valencia economy by improving the competitiveness of regional enterprises acting on six strategic lines:

- a better productivity and economic efficiency
- diversification
- internationalization
- promotion of investment in technologic innovations
- investment in better human resources
- identification and development of Strategic Industries

setting up an ambitious transversal strategy with important impacts on private industry sector. Although EPI does not dedicate a strategic line to sustainable management of IAs, it foster directly and indirectly actions by means of the midterm measures and objectives. Among the indirect ones, should be mentioned "training of human resources on sustainable solutions, technological investigations channeled towards green industries, promotion of new sustainable industries such as agro-food, eco-building, renewable energy".

Anyway, the most important measure focused on sustainable management of IAs is included in the development of strategic industries line of EPI. Regional Government has in fact created a task force of experts of public and private sector with the aim of defining and supporting a **management model for IAs of Valencia Region**. In particular, the themes of governance, financing, sustainability parameters, responsibility and autonomy of the Managing Authority will be discussed. Despite there are already unitary managed IAs, in Valencia Region there is not in fact a unique reference model, as the managing experiences develop their activities according to their own criteria and needs. Another important mission of the task force will define criteria for granting a certificate or label which is a guarantee of quality and efficiency to IAs. This certificate or label will allow IA and the settled enterprises to get access to funding opportunities, public contracts and better commercial results.

The work is still in progress.

4.4 Tools for environmental performances of SMEs

Several tools exist for supporting eco-efficient production processes in SMEs. Hereafter the database of environmental technologies developed in Act Clean project, with ENEA among the partners, is presented.



The **Act Clean** (Access to Technology and Know-how in Cleaner Production in Central Europe) project (<http://www.act-clean.eu>) has been funded by the Central Europe Programme 2007-2013 (Interreg IVB). The project, aimed at creating the first Central European network for cleaner production and eco-innovation, supported eco-efficient production processes in SMEs by promoting their access to **environmentally friendly technologies and management tools**.

Database of environmental best practices, aimed to share the existing solutions to environmental problems among each Country and promote their application in SMEs, has been one of the main output of the project. Up to now, the database includes more than 500 best practices organized in folders on the following topics:

- environmentally friendly technologies;
- management solutions (e.g. in the field of water or energy);
- management tools to identify and improve the environmental impacts of processes and products (Life Cycle Assessment, Ecodesign, Environmental Management Systems);
- diagnostic tools (e.g. emissions analysis, energy efficiency, CO₂ calculation software).

Entering the database, it is possible to search for information on the best practices through a specific search menu, selecting some key parameters as e.g. country, industry sector and keywords. Each folder contains the following information:

- Process description;
- Innovative aspects (environmental, social, economic);
- Advantages and constraints;
- Current stage of development;

- Intellectual Property Rights;
- Costs;
- Application examples.

The database is available at <http://www.act-clean.eu/index.php/Act-Clean-Database;43/1> and is accessible free of charge. Each company or institution can insert their best practices on their own or contact the National Contact Points if they require any assistance.

Furthermore, the **Act Clean Cleaner production Tool box** (<http://studioadhoc.dnsalias.com/actcleantoolbox/toolbox.html>) collects references and links to eco-innovation tools (handbooks, checklists, training courses, technical guidelines, specific diagnostic tools) developed in Central European countries for providing solutions to SMEs needs in the field of emission, waste, energy, resource efficiency, Environmental Management System and Life Cycle Assessment.

4.5 SMEs Self evaluation tools for energy efficiency

According to Directive 2012/27/UE, within three years after its entry into force, the implementation of an energy audit for all large companies it is mandatory and its upgrade is required every four years. SMEs were excluded from this duty, despite this process would have helped them to improve their energy issues, enabling them to abate the initial costs of the analysis with an increased business efficiency.

The energy audit is a systematic set of measures, data collection and analyses of specific consumption parameters and operating conditions of all the energy systems of a company. It is defined as a technical-economic evaluation of energy flows. The most representative measures are collected together with the possible interventions in an Action Plan which contains all the necessary parameters to define the most appropriate energy choice.

Many tools exist on the web to do a energy self-audit and assist companies to take informed decisions. The proposed tool, selected among many others, has been realized by **ABB**, a global leader in power and automation technologies, and is distributed (via registration) on its web portal⁶. It was chosen because of ABB reputation, it is free of charge and can be used in multiple languages. The tool is applied to industrial processes and internal activities. Its objective is the

⁶ ABB, http://energyefficiency.multicore-sistemi.com/users/sign_up

identification of solutions aimed at reducing energy consumption in the industrial sectors. The proposed auditing system is structured in three phases:

- **Check-Up:** self-assessment analysis by an on-line questionnaire, according to the specific industrial sector and qualitative evaluation of improvement.
- **Flash Audit:** areas, systems and processes detailed mapping, determination of macro solutions and efficiency rate.
- **Feasibility Study:** feasibility study and design of customized solutions for improvement actions.

The tool is intended to be both a diagnostic and a decision support tool that leads the customer to the best energy decisions. The proposed improvements can be achieved through technological or management interventions.

Another interesting application that completes the ABB tool is proposed (free of charge) from **RETScreen International**⁷. RETScreen is an Excel-based clean energy project analysis software tool that helps decision makers to quickly and inexpensively determine the technical and financial viability of potential renewable energy, energy efficiency and cogeneration projects. It has been developed with the contribution of numerous institutional, industrial and academic experts. Available in multiple languages this tool includes databases of products, landmarks, hydrology and climate data from around the world.

⁷ http://energyefficiency.multicore-sistemi.com/users/sign_up

5. Conclusions

MEID project, in line with recent European policies on environmental performances and economic development, has allowed for the definition and testing of an organizational and management model for the Industrial/Productive Areas that aims to improve their own environmental, social and economic performances, in other words, their attractiveness.

In the development of the project activities and in the phase of model testing, some important peculiarities have emerged as highlighted in the specific chapters of this volume. The SWOT analysis in the Mediterranean Industrial Areas context has confirmed that the approach to sustainability passes through the implementation of the principles of Industrial Ecology and the broader concept of eco-industrial development. Nevertheless it should be mentioned that the structure of the areas and the typical small medium dimension of the involved enterprises, poses some differences in the organization of the internal network of companies and related flows. Thus, due to these characteristics, a Managing Company is always fundamental for a sound development of the perception of the Area as a whole. Its presence guarantees cohesion among companies and provides an interface with the Local Authorities on one side, and the territory stakeholders, on the other.

The organizational status of the Areas has been taken in account to develop the three described paths which compose the MEID management model. This one takes advantage of many existing tools developed in MEID or in other similar projects and adapted to MEID objectives. These synergies have also been useful for the development of the MEID Guide for the Construction of Environmentally Sustainable Industrial Buildings.

MEID project through its several activities has confirmed that to improve their performances and became more attractive and competitive, Industrial Areas need to develop state-of-art infrastructures and innovative services, which can help enterprises to face the increasing challenges of the European legislation and to approach the new paradigms of Green Economy. A common understanding of the needs and the development of cooperation attitudes among the companies settled in the Area, pushes for the creation of enterprise networks which increase the SMEs possibilities to compete on international markets.

At this aim, sound collaboration among three different actors: Industrial Area

companies, Local Authorities and Territory/Local community is therefore very important. Indeed, only a shared industrial policy, where all the stakeholders of the Area, including the local population, are involved in the main decisions, will allow to foster a climate of cooperation and to accomplish the set objectives. The cultural approach to sustainability is the focal point of this process. It should be understood that the role of the Local Authorities as facilitators for the sustainable objectives of the Industrial Areas is mostly connected to the administrative and regulation relief, rather than to financial incentives who still, remain important. This means that by a careful examination of needs and consequently an accurate Area policy with appropriate administrative facilitations and regulation relief, the industrial areas can seriously consider the transition to sustainable ones, with benefits for all.

Attachment 1

The pilot Industrial Areas of MEID project

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Vilamarxant Industrial Area, Spain

Industrial Area location

Vilamarxant Industrial Area is located about 30 km North-west of Valencia town, in Spain.

Original situation of the Industrial Area (*ex-ante*)

Vilamarxant is a small municipality close to Valencia with a population of 9,000 inhabitants and an extension of 71 km², 25% of which is composed of forest, since Vilamarxant is surrounded by preserved natural landscape. It has a higher population density than the nearby municipalities which puts pressure in efficient urban and land planning strategies. Moreover, the natural landscape is very important for the economy of the region, since tourism is one of the most important economic sources. Therefore, there is a clear interest in boosting sustainable development of the area.



Figure 1- Vilamarxant location (image from Google Maps)

These premises directly affect the industrial strategy of Vilamarxant, which has to be efficient in land use and sustainable management. This industrial strategy is focused on two different Industrial Areas:

• a non structured IA named “Enchilagar del Rullo” created in the 70’s, composed by about 80 SME’s belonging to different industries, mainly car waste, plastic and agro-food;

- a new IA designed as a cluster of agro food industry and supposed to be capable of gathering mayor factories and distributors at international level.



Figure 2 - Enchilagar del Rullo IA location

Objective of the intervention

The interest of Vilamarxant in MEID project is double, since it is different according to each one of its strategic industrial lines:

- to turn Enchilagar del Rullo into a Sustainable Industrial Area by means of implementing a centralized management integrating economic efficiency and

environmental objectives. In other words: to achieve its sustainable management;

- to design the new Industrial Area as a green Industrial park right from the beginning.

Taking into account this framework, the objective of pilot actions is to test MEID model in both scenarios, so that Vilamarxant City Council can assess the inclusion of sustainable management standards in its strategic industrial plan. The pilot actions, thus, aim at testing in Vilamarxant MEID model's methodology and tools of its first and second path, i.e. "New IAs" and "Non Structured IAs", by creating a working group composed by technicians of Vilamarxant City Council and experts provided by Fundació Intraeco, partner of the project. This working group aims at studying both different issues that the strategic plan is meant to deal with and how MEID model can contribute to channel it towards efficient sustainable management procedures. Therefore, the methodology of the working group has been mainly the discussion about general issues to identify the necessary information and actions to be carried out in order to draft the strategic industrial plan in sustainable management terms.

Expected results (*ex-post*)

The main expected result is to draft a global industrial strategic plan in terms of eco-management to achieve an Eco-Industrial Area Certification enabling Vilamarxant City Council to implement sustainable management practices in Enchilagar del Rullo and improve its environmental performance and economic efficiency. For the new IA, the objective is to apply for Strategic Industrial Area Funding Call launched by Regional Government, which takes into account the sustainability of the Industrial Areas applying for the funds.

In short term, the pilot actions carried out during MEID project are meant to lead Vilamarxant City Council to implement first actions included in first phases of MEID model:

- Path 1: New IA: involving stakeholders in the design of the strategic plan;
- Path 2: Non structured IA:
 - * collecting data about settled enterprises in Enchilagar del Rullo;
 - * canvassing funding opportunities;
 - * boosting networking among settled industries.

Partners involved

As mentioned, the working group is composed by permanent members:

- Fundación Intraeco representatives;
- Vilamarxant City Council Members representing Urban, Economic and Legal Departments.

Besides, a wide range of stakeholders have been invited to join the working group meetings to provide valuable information. These stakeholders are classified as:

- services providers of water supply and waste management;
- public representatives of other municipalities;
- private stakeholders: SMEs settled both in Vilamarxant Industrial and urban areas;
- consulting experts in sustainable solutions applied to IAs.

Final evaluation and recommendations

The general information provided during the MEID project trainings was very valuable, since it was an optimal introduction to understand how sustainability can be reached in Industrial Areas. The result of this first contact with the topic was the identification of those environmental areas in which Vilamarxant's IAs are interested. These topics were those on which the technical tables were focused:

- socio-economic issues;
- energy;
- water;
- waste.

During the technical tables, focused on how to apply sustainability solutions to Vilamarxant as pilot, the discussion on these issues concerned several topics:

Economic impact of the investment: although the environmental sustainability is regarded as the final objective, the economic efficiency is still the main concern. The lack of financing sources and usually long term of return of the investment



Figure 3 - Workshop: role of Public Stakeholders in MEID model (Vilamarxant, February 2013)

are pretty discouraging.

Legal Framework: Public Authorities wish they had more binding legal tools to request a better eco-efficiency of the enterprises. Public Bodies are regarded, thus, as coercive agents rather than as facilitators.

Role and composition of Managing Authority: although stakeholders regard the managing authority as a necessary body, there are serious doubts about its ideal composition in terms of balance between public and private representation. Whereas public bodies do not have resources to finance this body, they do not want to lose control of issues related to promotion, regulations and so on.

These three points reveal that is difficult to deal with an old school mentality which is not completely ready to adopt MEID model. Therefore, the main suggestions of participants were:

- to make a major effort in awareness campaigns aiming at boosting a change of cultural approach to sustainability;
- to focus on Path 1 “New IAs” because it is much easier to incorporate sustainable management principles right from the beginning, mostly in specialized IAS (which would be the case of new IA of Vilamarxant);
- about Path 2 “Non structured IA”, participants recommend MEID model to stress the assessment of the return of investment (economic impact) as a tool to convince settled enterprises to cooperate;
- to scan financing sources or another ways of saving costs, such as sharing the same Managing Authority for several IAs. Likewise, the economic independence of Managing Authority is also to be further developed.

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ZIP Consortium of Padua, Italy

Industrial Area location

Padua IA is close the urban field of the city of Padua (Veneto Region), in the North-east of Italy.

Original situation (*ex-ante*)

It is the largest IA, without a break, in the North-east of Italy, managed by a single body. It also includes the largest freight intermodal area in the North of Italy. Over 1500 companies are located here (covering about 1050 hectares) and occupy 1200 lots with facilities. Established in 1958, Consorzio Zona Industriale e Porto Fluviale di Padova (*The Padua Industrial Area and River Port Consortium*), ZIP Consortium, is a public economic body whose partners on equal terms are the Municipality,

the Province, the Chamber of Commerce. It was set up with the aim of making it act as a driving force for the economy of the territory, by creating infrastructures and offering services to make it easier for companies to locate here.

Objective of the intervention

The objective of this pilot action was to test the MEID model within the pilot IA of Padua. Different procedural methods were considered to reach the requested goal and implement the theoretic model in an IA that already had developed environmental managing procedures, especially thanks to the Life SIAM project (2004-2007).

In accordance with the MEID partners, Fenice Foundation has defined the specific objective of the pilot action:

- organize public meetings to disseminate the outcomes of the project;
- present applicative solutions related to the background of the MEID model;
- present this applications as BAT with specific focus on the Padua IA;
- in the framework of BAT definition: propose the networking approach towards competitiveness in industrial compounds, in specific towards the mobility, alter-



Figure 1 - Padua location (image from Google Maps)

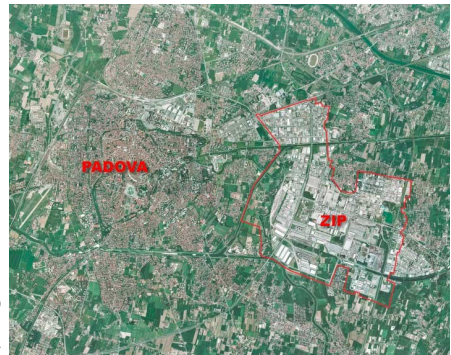


Figure 2 - Location of Padua and the IA

native energy and building construction compound;

- create a stable working group to monitor the application of the MEID model.

Expected results (*ex-post*)

In the long-term, an ideal of sustainable IA should implement all of the strategies necessary for the area sustainability, adopting an incremental approach leading to the definition of an improvement pathway as a function of the area's critical factors, the types of companies settled there, the characteristics of the territory, and taking account of the demands of the Local Communities. The proposed procedure recognizes as objective of critical analyses the main infrastructures realized in the area, plus the identification of the key problems involved in the development and in the management of already existing IA aiming to "eco-industrial" expansions. The development of a sustainable IA starting from an already existing IA is considered a long term process whose consequences are unlikely to be immediate. Therefore, they must be designed and managed in order to allow a slow conversion and each procedural phase must be economically helpful; or, at least, propose economical possibilities.

Primary objective of the pilot action was to create a working group, composed by technicians of different sectors (industry, administration, authorities) that could evaluate and validate the MEID model and that could use it to raise awareness and start cooperation activities within the Padua IA. After a preliminary validation phase, the objective has been to evaluate the real feasibility of the activities, introducing some key aspects into the local policy. Therefore, the working group, throughout ZIP Consortium, has started to enhance the IA conversion by supporting and promoting the MEID protocol outcomes; plus, it has promoted development of enterprise cooperation fostering specific compound networks.

Starting point: in accordance with ZIP, the activities have been related to territorial and economic planning within the framework of the Plans of Territorial Layout (Pat, Pati) provided for the new town planning Regional Act and in the Agenda 21 Plans which have already been carried out. To foster the involvement towards the project, Fenice Foundation has invited the working group to sign a Pro-



Figure 3 - View of the IA

toloc of Agreement on MEID model to maintain high profile involvement, both in formal and informal level, throughout a commitment towards the Local working group. In fact, a large number of technicians have taken part to the activities, production and elaboration of data, documents discussion and decisions making. In this framework, the Protocol of Agreement aims to maintain commitment towards the project after its end and represents the first example of the project outcome: the commitment of the local community towards the MEID model application. The stakeholders have subscribed it formally, recognizing officially the value of MEID activities for the development of sustainable IA, ensuring to participate themselves to continue the application of the model after the project end.

Secondary objective was to raise the creation of networking activities in Padua IA and foster the gathering between companies from same industrial compounds throughout a series of meetings/working sessions organize in Fenice's green Park. The proposed networking activities were mainly related to: photovoltaic system, thermal heating systems, energy providers, safety in industrial installations, roof and building compound.

Indeed, the critical factor was the economic success. While the initial concept was focused on the exchange of knowhow, the companies have highlighted that the success of company networks must foresee the adoption of strategies to increase the efficiency



Figure 4 - Workshop of MEID project

of each part of the industrial compound, ensuring industrial payback. Apart from the environmental and economic aspects, such strategies must also cover the social ones, guaranteed by the involvement of the Local Community. Industrial networking is therefore a useful instrument for pursuing economic benefits by reducing the bureaucracy and indirect pressure, but also as an organizational model useful for setting up an alternative development at local and regional level.

Partners involved

The partners were carefully selected on Padua's territory in order to create a balanced working group that could be able to evaluate the different issues linked to the model application (administrative, technical, economical, etc).

Partners involved: Administrative: Acegas Aps, (Energy Agency and Service Provider Company), Fondazione Fenice Onlus (NGO administrator part of IA Managing Authority), Veneto Innovazione (in-house company of the Veneto Regional Government), Polo Tecnologico per L'Energia di Trento (energy engineer), Istituto Zooprofilattico delle Venezie (Institute on prevention, control and research activities in three main areas: animal health and welfare, food safety and environmental protection), Parco Scientifico Galileo (energy-industrial engineering company), Helios Technology (photovoltaic company), Up-solar (photovoltaic company), CNA Padova (National Confederation for SME's), Federterziario Clai (Regional Confederation for Craftsmen), Municipality of Padua, Environmental Office of Municipality of Padua, Upa - Mandamento of Padua (Provincial Craftsmen Union of Padua).



Figure 5 - Workshop of MEID project (Padua, November 2011)

Final evaluation and recommendations

The working group will foster the applicative solutions that could be raised in the Padua area, giving technical and strategic support. The specific challenge is to address and spread the model for the development of sustainable IA within the range of key actors each company/institution can reach. To this end, the group committed to support future developments linked to the MEID project by a direct backing of Fenice Foundation Onlus upcoming activities.

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ASI Consortium of Ragusa, Italy

Industrial Area location

Industrial Area of Ragusa is located in Southern Italy, in Sicilia Region.

Original situation (ex-ante)

The settlement of the ASI Consortium of Ragusa (today I.R.S.A.P. – Regional Institute for Development of Productive Activities), with an area of 716 ha, comprises areas foreseen for industrial development (64.2%), handicraft (3.3%) and commercial (2.7%) businesses, while the remaining 29.9% is dedicated to services and green areas.



Figure 1 - Ragusa location (image from Google Maps)

In 2007, the current Industrial Area close to Hyblaean Mountains (“Monti Iblei”), partially included in the Province of Ragusa, was saturated and a possible extension was thought.



Figure 2 - Industrial Area of Ragusa

The Revision of the Urban Plan for the Industrial Area of Ragusa was an opportunity to give a different perspective to the industrial develop-

ment of the area. From the beginning, it was taken into consideration the approach to sustainable development. The pilot area is a part of the enlargement of the existing IA of Ragusa, according to plan, with an extension of 112 ha located in the country side close to the IA. Its aim is the integration of the activities of the new IA with the city. During the area selection procedures, a particular attention has been given to the existing infrastructures (as roads and harbour) and services (sharing them with the close IA), but also to the landscape plan, respecting and designing the boundary of the area in accordance with the existing old structures and social culture (as the typical dry stone walls).

Objective of the intervention

The objective of this activity is the drafting of a Masterplan, according to the MEID model and Guide and the feedback of the key-actors involved in the technical working groups (WG). A study group, consisting of young technicians, exam-

ined the existing elements, the information provided by the project, the technical standards for the implementation of the Masterplan for the IA and the best practice at European level in order to generate some proposals: a system of roads with green paths, enhancement of local vegetation and dry stone walls that characterize the area, a sustainable public transport with electric vehicles and a bike path, a system of energy saving and the use of alternative energy, integration of services with the existing urban and Industrial Area and the creation of multi-functional spaces. In particular, in the Masterplan attention has been given to:

- the organizational and management structure;
- the settlement system;
- infrastructure and centralized services;
- mobility system;
- the green areas.

There have been analyzed the Technical Implementation Techniques (NTA) established by the Plan and there were proposed new planning parameters to be observed within the *ecopark*. This first draft of the Masterplan and the main results of the MEID project have been tackled during the WGs. After selecting items, two major topics have been chosen:



Figure 3 - Workshop of MEID project in Ragusa

- company management instruments for Industrial Areas governance;
- organization and management of an eco-sustainable IA in Ragusa.

Expected results (ex-post)

The final Masterplan will be presented to the Competent Authorities (Sicily Region and some involved Municipalities) to be integrated into the strategic plan of the area. After this planning phase, the objective is to evaluate the real feasibility of the project at economic level, introducing some key aspects into the regional policy. The economic situation at national and regional level during these last years can be a problem for a “quick” application. Still, some steps can be done in order to apply the main proposed solutions even into the existing areas. The aim

of the development plan for the next years, is the integration of the new aspects of the Green Economy with the growth of the IA.

Partners involved

The ASI Consortium of Ragusa held on 19 - 20 of November 2012 some Technical WGs on major topics, here listed, with the objective to put the basis for the guidelines, to integrate the MEID model into the territory:

- Urban planning - Infrastructures - Facilities
- Transports
- Social improvement
- Energy
- Water
- Waste
- Sustainable construction
- Management

The following stakeholders have been involved by communication campaign and invitation to the technical WGs:

- Trade associations: Confindustria (Confederation of Italian Industries), CNA (National Confederation for SME's), CASA (Confederation of Artisan Organisations), ANCE (National Builders' Association), API (SMEs' association);
- Local Authorities;
- Technicians;
- Stakeholders;
- Expert in environment;
- Builder – Manufacturers – Precaster;
- Trade union.

Final evaluation and recommendations

The feedbacks from the public have regarded administrative and economic issues and water management. These topics have been integrated and have given their contribution to the definition of the MEID pilot project for the sustainable IA in Ragusa. Given the interest in the topics covered, these issues will be illustrated in other public meetings, during which the topics of the "MEID guide for the construction of Environmentally sustainable industrial buildings", translated into Ital-

ian to ensure a larger dissemination, will be explored in detail. Public participation in the debate has contributed to enrich the information provided by the experts invited during the 2 days of technical meetings:

- bureaucracy is often seen as an obstacle to innovation; it is necessary to establish rules internal to the Industrial Areas, unique and unambiguous, for the correct performance of business;
- the figure of Managing Authority is therefore essential.

Another obstacle is certainly the economic aspect: the development of green economy should be encouraged in order to recover from the crisis.

Furthermore, on the base of a questionnaire distributed to attendees, participants advised to:

- simplify management of permissions and bureaucracy;
- disseminate results to key local and regional stakeholders (technical, I.R.S.A.P.);
- give credits to technicians to increase the audience of this kind of dissemination activities on the topic.



Figure 4 - MEID partners visiting the IA of Ragusa

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Attachment 2

Good practices in Mediterranean Industrial Areas

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SmartCity Malta, Malta

Area location

SmartCity Malta is located in Ricasoli on the eastern coast of the island of Malta.

Characteristics of the Area

SmartCity Malta is a joint venture between TECOM Investments (a member of Dubai Holding) and the Government of Malta. It aims to develop self-sustained business townships primarily for the ICT and media industries, allowing easy access to global markets in Europe and North-Africa. Apart from its unique location, SmartCity Malta provides state-of-the-art office space and infrastructure that caters to the business and lifestyle requirements of knowledge-workers and professionals. Amenities such as a lagoon, amphitheatre, landscaped open spaces, residential units, office spaces, shopping and dining boulevards, and hotels, are amongst a few elements that make SmartCity Malta unique and create a high-standard of living and a community of quality and convenience.



Figure 1 - SmartCity Malta location (image from Google Maps)



Figure 2 - SmartCity Malta

SmartCity has been designed with environmental sustainability in mind and the first building which has been constructed has been awarded LEED Silver accreditation by the US Green Building Council (USGBC). It is the first building in Malta to have been awarded such certification. SmartCity took appropriate steps to minimise the environmental impact of the construction materials including through sourcing material locally rather than importing from overseas. All wood used in the buildings was sourced from sustainable forests.

SmartCity took appropriate steps to minimise the environmental impact of the construction materials including through sourcing material locally rather than importing from overseas. All wood used in the buildings was sourced from sustainable forests.

The problem of water in Malta

Malta is an island located in the middle of the Mediterranean sea and has very limited water resources, thus the introduction of techniques to save and collect the water are very important for any building.

The solutions given by SmartCity Malta

The estate has been designed to capture all rainwater falling onto buildings. This will be stored in the stormwater harvesting tanks. In addition, 50% of rainwater falling onto the site will be captured and stored in a centralised facility. It is estimated that this will save 13 million gallons of water annually. Rainwater will be filtered before entering the storage tanks, with 80% of suspended solids being removed before storage. Harvested water will be utilised for sanitary facilities and for irrigation. The buildings incorporate a number of measures to reduce consumption of potable water. It is estimated that the features reduce water requirements by 42%. The measures include:

- harvested rainwater and air conditioning condensate is used for toilet flushing;
- low-flow taps with automatic activation;
- dual-flush toilets.

The following measures reduce the water requirements for irrigation whilst allowing the maintenance of an attractive and colourful landscape:

- careful selection of plants adapted to an arid environment thus reducing water requirements;
- utilisation of a drip irrigation network with timer control for more efficient delivery of water to plants;
- the use of organic mulch as a soil additive to reduce soil surface temperature and reduce water loss by evaporation.

Energy efficiency solutions

The building services incorporate a number of passive and active measures to reduce energy consumption. These include:

- heating, ventilation and air-conditioning system load optimisation;
- building envelope insulation;
- reduced glazing in the building envelope;
- energy efficient lightbulbs and minimum power density;
- metering and monitoring of consumption.

Most of the common external areas make use of LED lighting powered by batteries charged by solar panels. This has additional advantages such as the elimina-

tion of the need for trenching and passing of electricity cables. The rest of the street lighting fixtures make use of efficient LED bulbs yielding a reduction of over 60% in electrical requirements compared to traditional light fixtures.

In summer the intense sunlight heats up the external areas and creates a heat island effect. This can lead to increased ambient temperature and increased cooling load on the office buildings. In order to counter this, care was taken in the selection of external paving to utilise materials which reflect rather than absorb sunlight, thus remaining cooler and minimising the heat island effect.

Services within the area

Bus routes have been extended to within the SmartCity premises. Bicycle parking racks and shower facilities have been established in order to encourage greater use of cycling as a means of transport. Finally there are a number of parking spaces reserved for low-emission and fuel-efficient vehicles.

Sustainable procurement policies can substantially reduce the negative environmental consequences resulting from the extraction, processing, transportation, use and disposal of construction material.

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Zenica 1 Business Area, Bosnia and Herzegovina

Industrial Area location

Zenica 1 Business Area is located in Zenica-Doboï Canton, in the central part of Bosnia and Herzegovina.

Industrial Area characteristics

Zenica 1 Business Area is planned by Municipal regulations (Spatial Plan, Urban Planning Documents and Regulation plans). It has a surface of 33,3 ha with 53 established businesses among which there can be mentioned 31 business incubators and 1 centre of modern technologies involving around 700 employees. During the localization phase, the stakeholders have been involved.



Figure 1 - Bosnia and Herzegovina location
(image from Google Maps)

Management of the area and centralized infrastructure

The main elements that characterize this Area are common management structure (Municipality Authority) and infrastructures. The most common centralized infrastructures includes water, energy, waste (central sewage system), mobility, habitat and landscape and environmental monitoring of business areas (Municipality inspection). The enterprises use the joint infrastructure or services at the area on a mandatory basis.

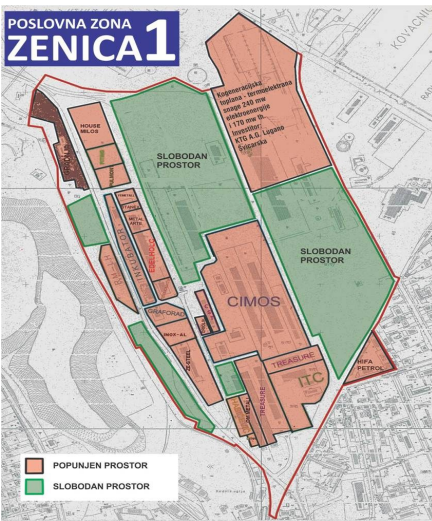


Figure 2 - Zenica 1 Business Area

Municipal Authority is competent and responsible for business area management and progress. The Municipal Authority offers diverse services to the Area which concern environmental actions such as environmental analysis of the area, environmental monitoring, implementation of environmental improvement plans, provision of socio/environmental services to the enterprises, realization and/or management of infrastructure for the area. Municipal Authority is

competent to control/force companies in order to improve their environmental behaviour or their participation in common services or centralized infrastructures.

Energy efficiency solutions

Actions towards optimization of energy performances, heating/cooling systems, ventilation systems, sanitary hot water system exist and it is regulated by the regulations which concern the minimum technical and sanitary and hygienic conditions for business facilities.

Moreover, within the IA it is planned to be constructed one of the largest investments in BiH "Combined Cycle Power Plant" (CCPP), co-generation power plant. This is a major step toward economic development and it will help to reduce pollution and improve quality life in the region.



Figure 3 - 3D model of future plant in Zenica 1 Business Area

The value of this investment is estimated on 250 million Euros.

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Carros Le Broc Industrial Area, France

Industrial Area location

Carros Le Broc Industrial Area is located just North-west of the city of Nice, approximately 12 km from Nice International Airport and 8 km from the A8 toll highway via a national route, in Côte d'Azur (South of France).



Figure 1 - Carros Le Broc IA location (image from Google Maps)

Characteristics of Carros Le Broc IA

Established in 1969, Carros Le Broc IA comprises 440 companies and 7500 jobs equally distributed in services, commerce and industry, located on this 188 hectare area. More than 60% of these companies have less than 10 employees. This area was entirely developed by the Alpes-Maritimes General Council for all types of non-polluting manufacturing and research facilities. With an accumulated turnover of 1,2 billion Euros, it is today an industrial force within the Côte d'Azur.

Waste problem and broad support for the implementation of a large scale waste management project

Effective and efficient waste management solutions represent important economic as well as environmental stakes in Industrial Areas such as Carros Le Broc. This IA produces 8000 tones of industrial waste per year. Collective efforts allowing for integrated solutions are needed in order to e.g. optimize waste management costs, improve waste recycling and recovery, comply



Figure 2 - Waste collection in the IA

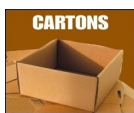
with regulations, conserve natural resources and strengthen the image of the industrial estate. The project of collective and selective waste management- Carros Indus'tri was a result of common efforts initiated by Club des Entreprises of Carros Le Broc industrial zone (supporter and manager of the project), local partners (CCCA- Communauté de Communes des Coteaux d'Azur), financial partners (ADEME - French Environment and Energy Management Agency, Conseil Gé-

néral, Région, Aslic) and technical partners (CCI NCA - Chambre de Commerce et d'Industrie Nice Côte d'Azur).

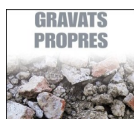
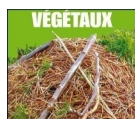
This project was integrated into the objectives of the Departmental waste programme and was the first pilot project at a departmental scale (Alpes-Maritimes).

The project Carros Indus'tri - A project led by companies for companies"

The project Carros Indus'tri was launched in 2003. In the beginning of the project 6 materials were targeted: paper, cardboard, plastic film, metals, wood residuals, other residuals.



Then, they were extended to 12, including also: white paper, green waste, humid waste (gaseous waste), construction waste (hazardous and inert), glass.



Meanwhile, containers were available for collecting waste (wide range of containers from wheeled units of 330 litres to fixed compactors of 30 m³). There was one team responsible for waste collection 5 days per week as well as one commercial and one operational representative. Collection frequency was adapted to specific needs, from once a month to once a day (with specific days for pooled collection of recoverable waste streams). Communication tools were developed. Subsidies of 1133780 Euros for investment and 188800 Euros for operations and communication have enabled the purchase of equipment for industries; employment of one person for 3 years, and two people for 1 year to carry out audits, economic studies and to train companies (around 300 audits carried out, 180 trainings, 500 economic studies).

The results can be regarded both from economic and environmental viewpoints:

- Economic results:
 1. reduction of waste treatment costs through recycling:
 - * storage rates doubled in 10 years;
 - * savings made by recycling compared to storing:

- for 1 ton scrap metals: 118% of savings;
 - for 1 ton of plastic films: 100% of savings;
 - for 1 ton of cardboard/paper: 58% of savings;
 - for 1 ton of wood: 42% of savings;
2. savings through negotiated rates at the industrial estate scale:
- * up to 75% of the container rental cost (strongest disparity);
 - * up to 10 % of the skip collection cost;
 - * collection costs decrease with the number of collection points (thresholds);
 - * negotiated costs on the purchase of new material.
- Environmental results:
 1. 4020 tons of non-hazardous industrial waste collected per year;
 2. increase in waste recovery rate from 30% in 2004 to 50 %;
 3. 270 participating companies (> 60% of the estate's companies); positive synergy effects created through determination, skill and action.

Further planned initiatives include waste reduction at source and participation in the implementation of the project "Opération d'intérêt national Éco-Vallée".

Contact

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Science & Technology Park of Sophia Antipolis, France

Area location

Science & Technology Park of Sophia Antipolis is located in the North-west of Antibes and South-west of Nice, in Côte d'Azur (South of France).

Characteristics of Science & Technology Park

Science & Technology (S&T) Park of Sophia Antipolis was developed to be in harmony with the natural environment. On the 2400 hectares of the park, 1200 are fully protected. The forests,

open areas, and rocky low hills provide a healthy work environment for the employees. In fact, the natural environment forms part of the overall project of Sophia Antipolis and is a source of attractiveness of the S&T Park. Regarding the



Figure 2 - View of S&T Park of Sophia Antipolis

Valbonne seemed like the right area. At the moment, more than 30000 people work in Sophia Antipolis and travel to and from work – still mostly by car. Although the development of the area can be characterized as a unique success story, the creation of the park created a flow of people and merchandise that was not fully comprehended.

Transportation problem

The public transportation network was practically inexistent, obliging most “Sophipolitains” coming to work or study in Sophia Antipolis to travel by car; the resulting traffic jam during morning and afternoon rush hours concerned also local habitants working elsewhere, i.e. Nice. There were few traffic lanes to disperse traffic coming into Sophia Antipolis: one road coming from Antibes, one coming from Grasse, one from Biot. The closest motorway exit for entering and



Figure 1 - Sophia Antipolis location (image from Google Maps)

choice of the area itself for the park, it is logical: already back in 1969, the territories close to the sea side were very highly priced. It was therefore necessary to choose an area less expensive, large enough, easily accessible from the highway, not too far from the airport, and in the heart of the region.

leaving the zone is Antibes; handling the flows of cars coming in from the entire zone is difficult. Thus, the traffic was frequently saturated and often completely jammed. The closest train station to Sophia Antipolis is Antibes, and few busses were going to Sophia.

Multi phase approach for the resolution of transportation problem in Sophia Antipolis

With common support and initiatives taken by Local Public Authorities, CASA community (community of areas of Sophia Antipolis), department of Alpes-Maritimes, PACA Region, "Club des Entreprises", companies as well as their employees a multi phase approach was initiated for solving the problem at the S&T Park level.

- Phase 1: Information gathering and mapping of the existing situation:
 - online survey on S&T Park web site;
 - consultation of companies and employees;
 - competition for idea generation.
- Phase 2: definition of possible partners:
 - implication of Local Public Authorities;
 - implication of the CASA community;
 - companies;
 - etc...
- Phase 3: development of initiatives by the various partners.

Thanks to the implementation of different phases all the actors of the zone (and the natural environment) benefiting from:

1. information on public transport infrastructure at <http://www.ceparou6.fr/>;
2. new buses and routes, free express bus from the railway station in Antibes, free shuttle buses in Sophia Antipolis at <http://www.envibus.fr>, free information by SMS <http://tempsreel.envibus.fr/>;
3. express busses from Nice to Sophia Antipolis at <http://www.cgo6.fr/fr/servir-les-habitants/deplacements/transport-collectifs/transports-collectifs/>;

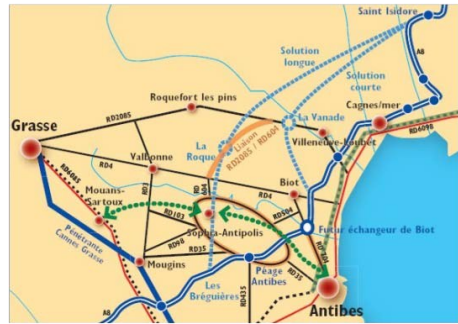


Figure 3 - Transportation network in the area

4. free public transportation for students with a ZOU! card at <http://www.infoler.fr/en/tickets-fares/tickets-and-fares-zou/conditions-of-use-n367>;
5. Websites for information on private car-sharing www.equipageo6.fr; www.ottoetco.org; www.covoiturage.com;
6. Policies and incentives encouraging employees to travel in a way contributing to reducing traffic and the carbon footprint of the company (e.g. SKEMA reimburses 50 % of the price of the annual public transport subscription).

Several other initiatives are planned for future such as the evaluation of implemented initiatives and development of new ones (Department of Alpes-Maritimes), expansion of the zone integrating transportation challenges and the involvement of other stakeholders (e.g. Autoroutes Estérel Côte d'Azur Provence Alpes (Escota)).

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1st Industrial Macrolotto, Italy

Industrial Area location

1st Industrial Macrolotto is located in the South-west of Prato, in Tuscany Region (North Italy).

Characteristics of I Industrial Macrolotto

The 1st industrial Macrolotto is the largest totally private industrial estate in Italy. It covers an area of around 150 ha and houses about 380 companies and about 3500 employees. The industrial system of the area is based on division of production among numerous SMEs, each one specialising in a



Figure 1 - I Macrolotto location (image from Google Maps)



Figure 2 - Localisation of I Industrial Macrolotto

(Interventi Di Riciclo Acqua), in charge of industrial water delivery treatment and recycling in I Industrial Macrolotto. IDRA is a consortium of 35 enterprises with the higher consumptions of the area.

Water problem

Textile industry is very water intensive. Water is used for cleaning raw material and for many flushing steps during the whole production processes. Thereby, wastewater reuse is essential.

1st industrial Macrolotto centralized wastewater treatment plant

In 1st Macrolotto has been realized the biggest wastewater treatment plant and recycling of discharged water (sand and active coal filtration, chemical disinfection) for industrial and fireproof purposes, made by CONSER and IDRA:

specific activity of textile sector (spinning, twisting, warping, weaving, dyeing and trimming or finishing). Historically, , in fact, Prato's economy has been based on the textile industry, famous around the world.

The area is managed by CONSER, a consortium of 240 enterprises located in the area. In addition, there are other "service-specific" consortia in charge of delivering specific area services. One of these consortia is IDRA

- the plant, managed by IDRA, was born in 1989, allowing a production capacity of water around 1750000 m³/year, with the idea of following enlargement;
- the plant was placed downstream from the municipal water treatment plant of Baciacavallo and only 5% of treated water comes from that plant. This water, to be used in the textile industry, is moved into another treatment phase;
- after the purifying process and special post- treatment, this wastewater is distributed to enterprises via the industrial aqueduct that has a network of around 15 km in 1st Macrolotto;
- IDRA also runs a water filtration plant of the River Bisenzio to contain the increase in the Prato industrial water system's salinity caused by the recycling of the waters.

The plant has been afterwards enlarged (in 1997 and 2005) and now allows a production capacity of around 5000000 m³/year of recycled water; it can meet all the 1st Macrolotto needs.

The two plants managed by IDRA are capable of treating around 5000000 m³/year of wastewaters and around 1500000 m³/year of waters coming from the River Bisenzio, allowing for an overall production of around 6500000 m³/year of water for industrial, fire and services purposes (design capacity).

The centralized wastewater treatment plant has no equal in Italy and few in the world for its huge size. It is a modern evolved method of saving natural water resources.



Figure 3 - Wastewater treatment plant in 1st Macrolotto

Involved stakeholders

GIDA (Wastewater Treatment Service Manager of Prato Province); IDRA (Private Consortium in charge of water delivery treatment and recycling in 1st Industrial Macrolotto); CONSER (Private Consortium for the management of the area); Municipality of Prato; Prato Industrial Union; Water Project Consortium.

The plant has been constructed by the private consortium of enterprises.

Cost of the plant

Art. 26, Legislative Decree 152/99: "the cost for industrial process in reduced for

recycled water". By providing this centralized service, CONSER is able to cover the costs for its management which are lower than 30000 euro/year. At the same time, the use of recycled water makes it possible to leave primary water in the aquifer for the generations to come. Moreover, the cost is competitive with other water supplies.

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Padua Industrial Area, Italy

Industrial Area location

Padua IA is close the urban field of the city of Padua (Veneto Region), i the North-east of Italy.

Characteristics of Padua IA

It is the largest IA, without a break, in the North-east of Italy, managed by a single body. Over 1500 companies are located here (covering about 1050 hectares) and occupy 1200 lots with facilities. Established in 1958, Consorzio Zona Industriale e Porto Fluviale di Padova (*The Padua Industrial Area and River Port Consortium*), ZIP Consortium, is a public economic body set up with the aim of making it act as a driving force for the economy of the territory, by creating infrastructures and offering services to make it easier for companies to locate here. The area is served by a 7 km long railway junction, 2 motorway tollgates, 5 service centers with post offices, hotels, restaurants, banks, offices, services for companies and people and a 30 km long fibre optic ring. 18% of its territory is for parks and gardens.



Figure 1 - Padua location
(image from Google Maps)

Employees needs

From a ZIP customer satisfaction analysis and from the findings of “Survey of Territorial needs analysis”, the following remarks emerged:

- in the IA there are about 1500 companies with about 25000 employees;
- there are difficulties in combining work times with the everyday problems of children;
- integrated structures for children from 0-6 years available in the area are not sufficient to meet demand;
- there are not existing structures with schedules compatible with the company needs (from 7:00-8:00 to 18:00-19:00).

The inter-company nursery of Padua IA

Based on the surveys, ZIP has decided to build an inter-company nursery in Via Peru street (Padua), a convenient location close to the traffic flows associated with production activities of the IA. The futuristic structure designed by a well-known technical study is based on the idea of a cellular system in constant change as the evolutionary process of the child, and dimensioned in four sections

of about 1000 m² of covered area and about 1500 m² of garden area next to the Roncajette Park and Fondazione Fenice Park.

The building was designed to host 80 children from 3 months to 6 years, from 7:30 to 19:30, including some vacation periods, and has higher standards, compared to other structures, regarding the size of the living areas, energy saving, indoor comfort, the use of environmentally friendly materials and use of energy from renewable sources. The nursery also has a parking lot with 70 spaces.

Regarding the energy issues, this project is a “thermal machine”. A system with geothermal heat pumps will reduce consumption to only 7 kWh/m³ year, about one third of a structure built with traditional technologies. The greenhouses, with



Figure 3 - Localisation of the inter-company nursery of Padua IA

The nursery is designed as a repeatable model ZIP: will soon be made a user manual, in order to increase awareness of sustainability users, who are often the last missing link to create a virtuous cycle.

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Figure 2 - The inter-company nursery of Padua IA

the opening part, is opposed to the mass of shells of cells made of sprayed concrete. Natural ventilation allows both to optimize the use of the greenhouse in summer, and to ventilate the bathroom through a dedicated path. The greenhouses are made of a transparent front dual-chamber that ensures the containment of solar gains.

Argixao Industrial Park, Spain

Industrial Area location

Argixao Industrial Park is located in Zumarraga (Gipuzkoa), a 10000 inhabitants town in the Basque Country (Spain).

Characteristics of Argixao Industrial Park

The Basque Country has a long and deep industrial tradition, being one of the strongest pillars of its economy. Despite its small extension (about 7200 km²), the number of Industrial Areas is quite high. SPRILUR, a public owned company created in 1982, is a key player in the industrial activity of the Region. Its goal is to provide industrial infrastructure (land and buildings) for the economic activity in Basque Country. SPRILUR owns and manages 42 IAs. Additionally, SPRILUR is shareholder in 24 companies (majority shareholding in 19 of them) that have developed 67 industrial estates under the so-called *Industrialdeak Programme*, in close collaboration with Regional Government and other local players. Environmental issues are gaining importance in the management of those IAs. This is the case of Argixao Industrial



Figure 1 - Basque Country location
(image from Google Maps)



Figure 2 - View of Argixao Industrial Park

Park, one of the industrial estates under the *Industrialdeak Programme*. Due to its strategic location, Zumarraga is a key communication knot in the territory, connected to the main transport infrastructures (train and motorways). The IA is located in the city's highest area, next to the motorway surrounding the town.

With an extension of 8427715 m², it is the location of 23 enterprises, employing more than 300 people.

The problem of environmental legislation in the Industrial Park

Companies (mainly SMEs) established in Argixao Industrial Park were not very aware of the environmental legislation that affected their economic activity. Besides this, information and advice concerning those issues was not easily accessible for them. Public bodies frequently have problems approaching the SMEs sector due to its fragmentation.

EKOSCAN MICRO project

This project (2002-2003) was oriented to solve those weaknesses, by raising awareness and interest of companies on environmental issues. Information and advice on the responsible and effective management of environmental issues was provided to companies on a free-service basis.

Companies participating in the project	No. of companies
• Total number of companies in the Industrial Park	23
• Number of companies in the project	16
+ Manufacturing companies	15
+ Service companies	1
• Companies with a Quality Management System (QMS) implemented	7
• Companies in the implementation process of a QMS	2
• Companies that aim to implement a QMS	2
• Companies with an Environmental Management System implemented	0
• Companies in the implementation process of an EMS	1
• Companies in which an employee is appointed to be in charge of env. aspects	2

Table 1 - Companies participating in the project

A consultation among the companies engaged in the project evidences that the project was successful in providing information and tools for the solution of main environmental issues faced by SMEs. Collaboration among different bodies in pursue of the same goal (SPRILUR, the Regional Environmental Agency IHOBE, Local Development Agency UGASSA and an external consultant) is one of the success factors of this project, taken up by other IAs in the Region.

Some of the results or lessons learnt of the project are:

- frequently, SMEs disown the environmental legislation that applies to them;
- public bodies have difficulties approaching the SMEs (fragmented sector);
- networking is shown as an effective tool, directing the efforts of different organizations towards a common goal;
- high satisfaction of companies increasing their confidence on public bodies.

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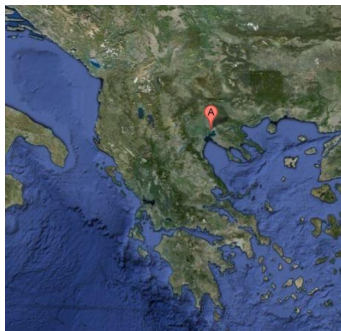
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Sindos Industrial Area, Greece

Industrial Area location

Sindos Industrial Area is located in Thessaloniki (Central Macedonia), in the North Greece.



Characteristics of Sindos Industrial Area

Sindos IA is the biggest one in Greece, about 10 km², hosting approximately 700 industries and 10000 employees. The business distribution by sector is indicated in Table 1.

Figure 1 - Sindos location
(image from Google Maps)

Industries	Distribution (%)	Industries	Distribution (%)
Food	22%	Machinery equipment	5%
Chemicals	2%	Finish	2%
Paper	4%	Plastics	4%
Metals	26%	Glass	3%
Various processes	13%	Electr(on)ic products	2%
Furniture	10%	Textiles and fines	7%

Table 1 - Business distribution by sector in Sindos IA

Material recycling facility

In the IA is located a material recycling plant, which serves the whole area. It is privately owned and a new one which has started its operation in May of 2010 and currently serves around 215000 citizens and the packaging wastes from Industrial Area. Waste of the IA are shown in Figure 2.

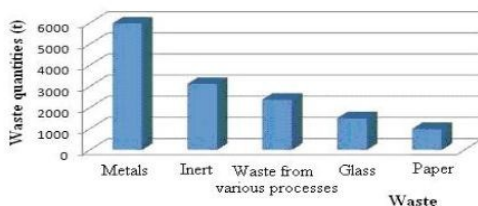


Figure 2 - Waste production in Sindos IA

Wastewater treatment plants

In the IA two wastewater treatment plants are present: the wastewater treatment unit, receiving wastewaters from processing plants of the whole Industrial Area,

and another unit, treating the wastewaters from tanneries. The effluent from the latter plant is further treated by the first one, while the generated effluents are discharged to Thermaikos Gulf. The total amount of produced waste waters is approximately 15000 m³/d in Sindos IA.

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Juan Carlos I Industrial Area, Spain

Industrial Area location

Juan Carlos I Industrial Area is located in Almusafes, Valencia, on the East coast of Spain.

Characteristics of Juan Carlos I IA

Juan Carlos I IA covers an area of around 143 ha, houses about 120 companies and 4500 employees. It was created with the support of Regional Government of Valencia together with the City Council of Almussafes to provide services to one of the mayor economic sources of the region,



Figure 1 - Valencia location (image from Google Maps)

FORD Factory, which also played an important role in the design of the IA. Therefore, it is not surprising that almost the totality of its enterprises are suppliers of

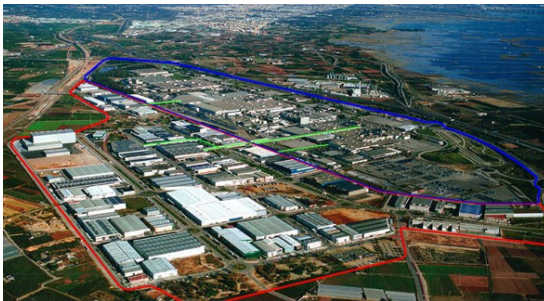


Figure 2 - View of Juan Carlos I Industrial Area. Blue line: FORD Factory; red line: IA Juan Carlos I

FORD, what means that Juan Carlos I IA has become one of main worldwide logistics centres of automotive industry. The Industrial Area counts with a Managing Authority called APPI (which stands for *Asociación de Propietarios y Usuarios del Parque Industrial*). It aims at providing common services

to the associated enterprises to achieve logistics improvements and efficient management of the IA to boost its economic efficiency together with sustainable development. More specifically, APPI offers these services to associated enterprises:

- legal advice on common issues;
- representation and mediation with Public Authorities;
- technical reports;
- to boost collective agreements;
- to scan new needs;
- to improve common services and solve common problems.

The problem of industrial waste in Juan Carlos I Industrial Area

Related to the last point, one of the common problems on which APPI is working is the waste collection and how to improve the quality and efficiency of its sustainable management together with the implementation of prevention policies, since enterprises used to be responsible for the collection of their own waste. APPI understood that waste collection could be a common service provided by an unique enterprise, what would surely improve economy efficiency by means of reducing the costs of the waste collections. This common service would also mean a great opportunity to settle new standards about sustainability of waste collection, another of the main concerns of APPI. The conclusion was that IA had to count with a common waste management system.

Common industrial waste management system

The project to create a common waste management system was launched on 2008 and was based on a report that counted with the participation of 31 enterprises. The first step was to assess what kind and which quantity of waste was being generated in the IA. The results were the following:

- * dangerous industrial waste : 700 tons;
- * non dangerous industrial waste: 10240 tons;
- * total industrial waste: 10940 tons.

Based in these results, APPI launched a call for tenders, which services had to fulfil the following characteristics:

- waste collection and transport from the enterprises to treatment plants (door to door service);
- waste labelling, including information about risks and handling procedure;
- implementation of tracking systems of dangerous waste;
- supply, installation and maintenance of the collections material, such as containers or special boxes.

Therefore, the new service was not only focused on achieve a better prices than individual services, but also to settle a new and environmental standards including risk prevention, logistics efficiency and safety.

The calls for tender arouse the interest of several enterprises providing the requested service. The selected one meant a reduction of 30% of the price, but also an improvement of the environmental performance of the enterprises as a group

by means of:

- less emissions of Co2 by improving logistics;
- better identification and homogenization of waste, what enables its proper treatment;
- better safety conditions.

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Budrio Industrial Area, Italy

Industrial Area location

Budrio Industrial Area, called “Cento”, is located 15 km far from Bologna in North Italy, in Emilia-Romagna Region.

Characteristics of Budrio IA

Budrio IA is one of the Ecologically Equipped Industrial Area (see Chapter 1) located in Emilia-Romagna Region. It covers around 137 ha, houses more than 150 companies.

Logistics Audit in the IA

In the frame of Ecomark project, a new common logistics service for SMEs settled in IAs has been tested, thanks to an innovative software addressed to optimize both routes and loads. This service interjects a logistics broker between the companies and the carriers.



Figure 1 - Budrio location (image from Google Maps)

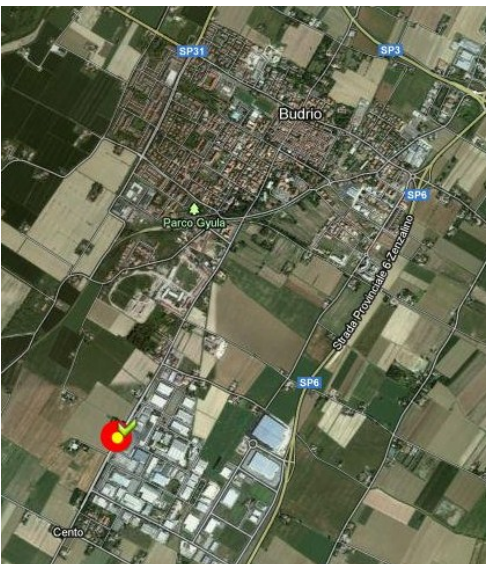


Figure 2 - View of Budrio Industrial Area

Using modern ICT-Tools (software), the broker supports the customers and the carriers in their daily transport planning. Firms often do the planning of transports internally, rarely using specific optimizing systems. The interposition of a broker between these two stakeholders introduces essential changes in the proceeding of the transport planning. The broker takes over the entire transport planning acting as a mediator between customers and carriers, reducing their effort to find the best and cheapest transport solutions.

Check up to contrast the lack of awareness in SMEs

Some meetings with entrepreneurs gave the opportunity to understand their point of view on logistics matters. In particular, it came out that SMEs do not

have awareness of the importance of a good and strategic logistics policy. This lack does not permit a whole management and control of their organization and a potential cost saving, while in an economic crisis period it could be important to optimize the entire supply chain to save costs.

The 'Logistics Audit' is a check up of the logistics state of the art of each enterprise involved, to increase the awareness of the importance of logistics and transport in SMEs management and encourage the joining of SMEs in collaborative services. The report

gives details also about a simulation of Logistics Broker Service in order to involve the enterprises in the development of the services. The team of experts and the software analyse data simulating the potential saving.

ICT tools to optimize routes and loads

The Province of Bologna customized the 2 software necessary for the Service implementation. The first one aggregates in a optimal way all the transportation orders coming from suppliers, subcontractors and customers of a single company. The second one calculates the optimized routes and draws the map marking the main laps and distances. The tool provides information on the status of road network such as load limits or roads width. This two software are accessible from the Ecomark project website in the private area.

Service implementation

The Province of Bologna decided to implement the Service in Budrio IA. 16 enterprises of the IA were recruited and analyzed with reference to their activity, the compatibility with other firms, their transport and logistics needs. 8 of these joined in the Service and have provided their transport data to the Province. Two experts were in charged by the Province to visit the enterprises that enjoined the Service in order to analyse their logistics organization and collect data on transport order.

A questionnaire has been distributed to each firm that aims at collect the

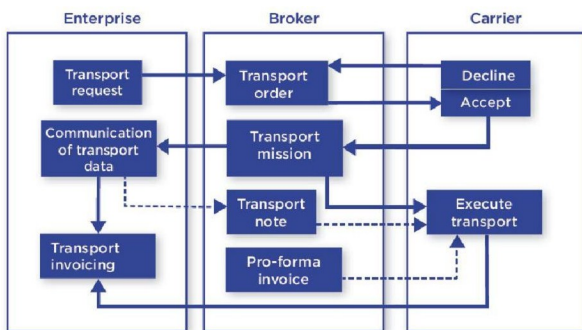


Figure 3 - Steps of the broker service process

transport data about 15 day of activity. The transport data were analyzed through the software Kassetts developed by the European project Kassetts implemented through the Central Europe Programme co-financed by the ERDF. Using modern ICT-Tools, the broker supports customers and carriers in their daily transport.

Given the list of all the transport requests, the broker carries out the planning and optimizes the allocation of the parcels on the available trucks of both customers and carriers. As a result, he receives transport orders which state the details of the optimized transports. The broker chooses the most suitable carrier and electronically transfers the corresponding transport data to him. The carrier who receives a transport order from the broker is able to decide whether he refuses the proposal or accepts it and executes the transport with his trucks. After the confirmation, the transport order becomes a transport mission and is automatically assigned to the specific carrier.

Table 1 shows the software analysis results. In the column "Kassetts scenario" the results of optimization data were resumed. On the other side, the "Best null scenario" column underlines the results in case each company aggregates their transport requests, but cannot aggregate with goods of other companies. The last column points out the saving possible in case of Kassetts scenario.

		Kassetts scenario	Best null scenario	SAVING
total number of orders	nr.	1.638,00	1.638,00	-
total weight transported	tons	125,62	125,62	-
percentage of regional orders	%	100,00	100,00	-
number of missions	nr.	307,00	357,00	-50,00
total lenght of routes	km	294.012,97	314.231,11	-20.218,14
tons-kilometers performed	tkm	65.135,95	63.491,48	1.644,47
percentage of aggregated missions	%	14,66	0,00	14,66
total time on road	hours	5.083,00	5.385,00	-302,00
percentage of time on road on total durations	%	63,45	67,84	-4,39
number of vehicle types used	nr.	4,00	4,00	0,00
total costs	€	240.734,28	257.288,65	-16.554,37
saturation coefficient (weight)	%	15,49	12,73	2,76
saturation coefficient (volume)	%	9,53	8,69	0,84
saturation coefficient (surface)	%	33,15	29,63	3,52

Table 1 - Logistics Broker Service experimentation results

There has been significant results in terms of reducing missions (-14%) and mileage (-20000km). This means savings for companies (-6/7%), reduced environmen-

tal impact, reduced traffic congestion and accident rates, and thus reduced social impacts. Encouraged by these results, the Province of Bologna is working to continue and extend the service.

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Ecologically Equipped Industrial Areas of Bologna Province, Italy

Industrial Areas location

Ecologically Equipped Industrial Areas (EEIAs) of Bologna Province are located in North Italy, in Emilia-Romagna Region.



Figure 1 - Bologna location (image from Google Maps)

Green marketing plan of Bologna's EEIAs

The Province of Bologna has developed specific tools for transforming 14 supra-municipal productive areas in EEIAs (see chapter 1). In the frame of Ecomark project, the Province of Bologna arranged a green marketing plan addressed to all these EEIAs, with the support of prof. Matteo Caroli (Luiss Business School).

Vision: the key-value is the idea that the local competitiveness is the result of a round circle activated by 2 main factors:

- a capital of tangible and intangible factors for a competitive advantage in respect to competitors settled somewhere else (e.g.: qualified human resources; efficiency in terms of costs, services, infrastructures);
- the role of the local economic actors that increasingly invest on local enhancement and on urban development.

EEIAs represent a component of the territory they're part of and they are a crucial factor for competitiveness of businesses and professional operators working there.

Target: the green marketing plan has identified the main targets of eco-industrial parks, and consequently to who address marketing strategies:

- the competitors of EEIAs businesses (firms already settled in the area; enterprises that could change their current settlement in other areas; enterprises that are looking for a new location);
- the stakeholders (public local constituencies; representatives of social components).

Positioning: in order to define a competitive positioning, the factors have been divided into 3 categories:

- * local level (other EEIAs, other consortia, etc.);

- * national level (other EEIAs or consortium in the Country);
- * international level (Eco-industrial parks).

We had also considered separately both the current position and the objective to be achieved. Actually, there is still a very weak overall perception of EEIAs' specificity and the potential benefits resulting from the settlement inside, rather the concern for the relatively higher costs emerges. These elements show that it is crucial to build a strong position in the mind of the target demand.

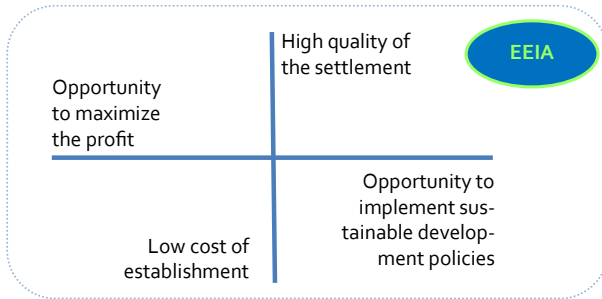


Figure 2 - Objective positioning
(processing by Luiss Business School)

Value proposition: value proposition explains why the demand target should choose a specific product and pay the requested price; in this case, the reasons

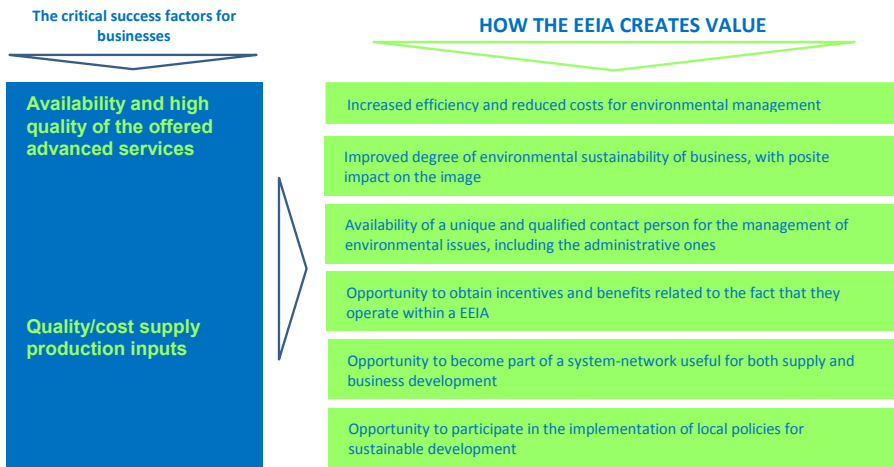


Figure 3 - Value proposition businesses
(processing by Luiss Business School)

why companies should settle in a EEIA and Local Authorities support its development. Since the EEIAs attract a double demand, businesses and local stakeholders, we need to identify and communicate outside two different value propositions.



Figure 4 - Value proposition businesses Processing by Luiss Business School

The operative marketing actions for EEIAs

The marketing strategies to take into account for translating the marketing principles into concrete marketing actions can be summarized as below:

- the territorial product: it is divided into 3 essential components (infrastructures, common services and advantages) with the addition of a 4^o transverse to the first 3 (system of firms established);
- the price: due to the current economic crisis, the high costs for the development of EEIAs have to be considered a serious critical element and it is essential to identify mechanisms to reduce the disadvantages resulting from the high level of initial costs (financial incentives; to expedited/facilitated administrative and bureaucratic procedures; availability of infrastructures and services able to provide cost savings for businesses);
- communication: it is essential to arrange an innovative communication plan that has to be coherent with the communication actions of the whole territory

rial system. We identified 3 levels for the communication strategy:

- the level for the communication of the system of the EEIAs located in the Province of Bologna;
- the level for the communication of each individual EEIA;
- the environmental communication.

The green marketing plan identifies three targets for communication activities: businesses, local stakeholders and lobbies.

	Businesses	Local stakeholders	Lobbies
Affordability compared to the higher costs of settlement	*****	**	*****
Best environmental impact of productions located therein	***	*****	*****
Facilities and environmental services distinctive compared to other industrial areas	*****	***	*****
Origin in a comprehensive project to improve environmental protection and competitiveness	*****	*****	*****
Location in the EEIA as a distinctive element of the sustainability policy of the firm	*****	*	**

Figure 5 - Grid contents-targets
Processing by Luiss Business School

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