



Centre of Sustainable Urbanism

European Green Capital Award 2016

10. Eco-innovation and Sustainable Employment



EUROPEAN
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2016

 **Zaragoza**
AYUNTAMIENTO

Spain

10. ECO-INNOVATION AND SUSTAINABLE EMPLOYMENT

10A. Present Situation

Describe the present situation in relation to eco-innovation and sustainable employment, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Where available, information/data should be provided from previous years (5 – 10) to show trends.

Make reference to:

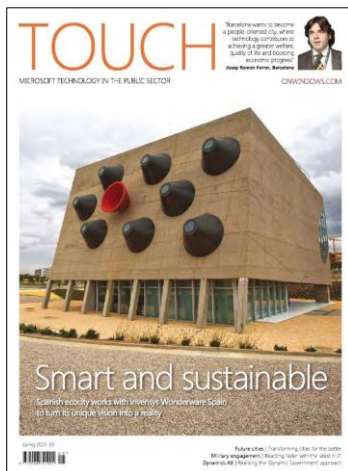
1. Innovations that address material / resource use, (substitution, minimization of material use, closing loops, etc) and reduce environmental impacts, i.e. measures to improve resource efficiency;
2. Awareness raising and training to encourage the development and take-up of environmentally friendly technologies, particularly through training in industrial and business settings. Make reference to the authority launching the initiative as well as its target audience;
3. Efforts to promote green skills, or green jobs;
4. Efforts to promote Green Public Procurement (GPP);
5. Social innovation/stakeholder participation, including for example community programmes, that shows entrepreneurship and new ways of organization that promote sustainable development and protect the environment locally and globally;
6. Share of the city budget dedicated to support environmental R&D (with particular reference to eco-innovation) by public and private entities;
7. Number of jobs created in green sectors in total, as a share of total jobs in the city and as total jobs created during a period of one year;
8. Share of hybrid or fully electric cars in total stock of vehicles owned by the city. Number of charging outlets available for the cars owned privately

(1) *Business Incubator Centre Milla Digital (CIEM)*. Bioclimatic building “Zero Emissions” (*graphic 1*), holds in its 2,100 m² 41 high added value firms and 100 workers.

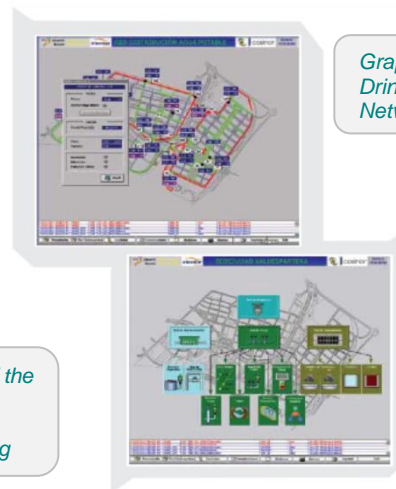


Graphic 1. Poster of the Zero Emissions Building and detail

Valdespartera Ecocity (9,680 dwellings) A bioclimatic sustainable construction model. Its centralized system manages the network of drinking water, sewage and treatment of rainwater, irrigation systems and supply of gas and electricity, lights, pneumatic waste collection and environmental control of the dwellings (*graphic 2 and 3*)



Graphic 2. Front page of the magazine TOUCH – Valdespartera Centre of Sustainable City Planning

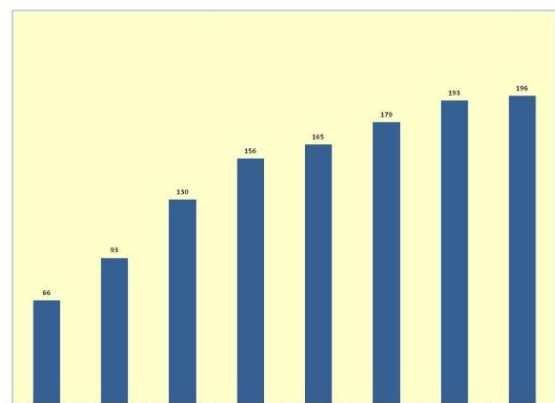


Graphic 3. Valdespartera Drinking Water Distribution Network

(2) Meetings with Agenda 21 Club for fostering systems of environmental management in companies. Its results are assessed by the indicator “Sustainable Management of the Local Authority and Local Companies (graphic 4).

Zaragoza Environmental SME Consultancy with 106 member firms.

Digital Mile is a development project for the creation of a City of Innovation and Knowledge including the mentioned CIEM. It concentrates very important activities of international relevance in the field of energy and environment (graphics 5 and 6)



Graphic 4. Organizations members of the Meetings with Agenda 21 Club



Graphic 5. CIEM and CAT buildings of the Digital Mile



Graphic 6. Poster of an event held in Zaragoza Digital Mile

(3) Fostering green talent and jobs is a transverse axis of the municipal policy:

Ebro Environmental Centre develops projects to spread green values

Green Grid and Blue Grid Program consists of knitting the built city and its natural periurban territory by means of corridors, orchards and green rings and belts

Urban orchards spread natural agriculture among unemployed and handicapped people as a previous step to the creation of companies

Program of Educational-Environmental Public Awareness 25,000 school children participate in the activity “Stop the CO₂”

Zaragoza, a Water Saving City Project aims at saving and reaching and efficient use of water through technological changes (*graphic 7*). 50 good practices and 170,360 commitments were identified in 2006-2008



Graphic 7. Advertisement of Zaragoza, a Water Saving City

Strategy on Energy 2020 and its passing foreseen for the beginning of 2014 is based on the boost of the Green Economy and the creation of more 6,000 jobs until the year 2020.

(4) The Municipality applies environmental criteria in public procurement.

Bylaw/6 2007 makes compulsory the use of ecological fuel in all the municipal vehicles and those of firms contracted.

(5) ZINNAE Cluster (Council, research institutes and companies), develops innovative initiatives for an efficient and sustainable use of water as a source of employment:

- ✓ *Parque Zero*, trial project for management of green zones. LIFE+2013.
- ✓ *Water Efficiency in European Urban Areas*. 7th FP.
- ✓ *European Alliance for Innovation in Water Management*. (*European Innovation Partnership*) (*graphic 8*)

The business sector is also active in creating innovative solutions:

- ✓ *Promoting Industrial Energy Efficiency for SMEs* (Zaragoza University and Chamber of Commerce). IEE.
- ✓ *CHANGE*. Optimization in the use of energy by the SMEs (Chamber of Commerce). IEE
- ✓ *Life CONNECT*. Setting-up of a network for recharging electric vehicles. (Chamber of Commerce).

(6) Budget for the whole environmental R&D&i include:

Zaragoza Smart City (*graphic.8*) with an annual budget of more than 3.5 million euro. Smart City is the biggest project of the city of Zaragoza for creating a city model able to combine sustainable mobility and energy, and environmental efficiency with innovative and technological projects in every field and public service of the city.

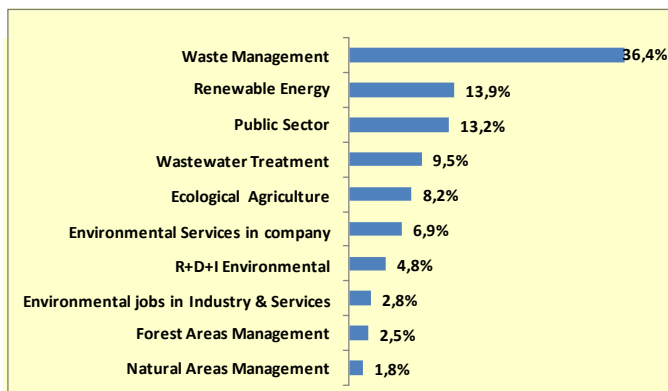


Graphic 8. Presentation of the Smart City model applied to the city of Zaragoza

The **average municipal spending in environment** reached a total of 166.96 million euro in 2012.

The municipal budget for **Science and Technology** is more than 4.5 million euro for the year 2013.

(7) There are approximately 13,000 green jobs in Zaragoza, a 4.9% of the total (*graphic 9*)



Graphic 9. Distribution of "green jobs" in Zaragoza

(8) The agreement by which the Council commits itself to replace all its fleet by electric and hybrid vehicles will be applied also to the companies working for the City. In Public Taxi, 17.5% are hybrid and there is one electric. Zaragoza has 50 recharge points for electric vehicles.



Graphic 10 Electric vehicle of Waste Plant

10B. Past Performance

Describe the measures implemented over the last five to ten years concerning eco-innovation and sustainable employment. Comment on which measures have been most effective.

Make reference to:

1. Initiatives aimed at increasing eco-innovation and sustainable employment, e.g. projects under Cohesion Policy funds, LIFE, Environmental Technologies Action Plan (ETAP), Green Public Procurement (GPP), as well as national policy initiatives;
2. How European and national policies have been transferred into policy action at the city level;
3. The publication of reports, such as green accounts, revealing the timely implementation of planned initiatives.
4. Any action which the city is taking in order to develop the urban tissue/infrastructures in an innovative/sustainable way

(1) The City of Zaragoza has had a direct and indirect participation in different projects which apply innovative models for the sustainable development of the city:

LIFE “OPTIMIZAGUA - Demonstration of water saving for irrigation uses through experimentation of artificial intelligence integrated in traditional water control systems” (LIFE03 ENV/E/000164): Implemented between 2003 and 2006, this project has managed to create a European model of reference for an efficient management of water for irrigation uses. Serving as an example, its effect has made the municipal management of parks and gardens possible.

INTERREG IIIA – REVITASUD project (2004 2008). Its implementation has pooled the following environmental measures: funding of solar places and thermal insulation, workshops for saving energy and mobility actions.

SWITCH project- Sustainable Water Management for Improving the Future Health of Cities. Implemented between 2006 and 2011, this project fosters an efficient use and management of water by its citizens. It forms part of the 5th Framework Program of the European Union and is led by UNESCO-IHE (Institute for Water Education).

Renaissance is a research and demonstration project that forms part of CONCERTO initiative and co-funded by the European Commission by its 7th Framework Program. It has obtained the following results:

energy saving, bioclimatic buildings and incorporation of renewable energies: avoid the emission of 5,000 tons/year of CO₂.

new buildings at Valdespartera district: 616 bioclimatic and innovative dwellings

rehabilitation works at Picarral district: 360 homes, 65% of energy saving and saving of 231 tons CO₂/m².

rehabilitation and installation of a photovoltaic system (19 kW) in the public school Cándido Domingo.

Valdespartera Centre of Sustainable City Planning. Research and information on bioclimatic construction.

This project has been awarded the following prizes:

BEST qualification of the 2010 Rehabilitation Program (UN, Dubai)

Endesa First Prize. Action at Delicias district.

AVS First Prize for action at Las Fuentes district (2011).

(2) The participation of the City of Zaragoza in innovative European and national projects is based on a strategy that gives priority to the creation of employment and to environmental companies, being complemented by a wide array of institutions of reference focusing on sustainability: Fundación CIRCE, specialized in renewable energies and technologies and with more than 250 researchers; Research Group on Transport and Logistic (GITEL); Aragon Technological Institute; and other research centres linked to the University of Zaragoza, the Institute of Carbochemistry, the Centre of Agro-feeding and Technological Research of Zaragoza (CITA), and the Nanotechnology Institute Aula Dei.

Zaragoza has 12 clusters representing the 48% of GDP of the region and composed of more than 470 companies with a turnover of around 17,500 million euros and 86,187 workers. From the 12 clusters, three have a direct link with eco-innovation:

ZINNAE, urban cluster for an efficient use of water: 24 companies and organizations aiming to turn Zaragoza into an international referent in the efficient and sustainable use of water. Approximately 5,600 firms of the province and its 38,500 workers are linked to the sector.

Car cluster: This cluster is formed by 32 companies and organizations and among its goals is the development of new sustainable technologies (hybrid and electric vehicles, biofuels, hydrogen, etc)

Biomass and energy cluster: It is formed by 13 companies and organizations that form a forum of reference in the Ebro Valley, and for fostering, innovating and developing projects that contribute to the development of biomass renewable energies.

62 members form Aragon Foundation for the Development of New Hydrogen Technologies that works for the development of hydrogen new technologies in synergy with renewable energies for boosting economic activities related to the use of hydrogen as an energy vector. 75 projects have been implemented in its framework, counting with the collaboration of 185 entities that have produced 7 patents. In the research field, 13 groups have been formed that have produced 70 doctoral thesis on hydrogen and fuel cells.

The City of Zaragoza has a Municipal Bylaw on Energy Ecoefficiency and the Use of Renewable Energy in its buildings and facilities from 2007. This reinforces its political strategy on energy, regulating constructions with bioclimatic criteria and fostering a rational use of energy and renewable energies.

Another one of the consolidated policies refers to the development of renewable energies. Zaragoza and its surrounding area has 34 wind power plants with a power of 712.28 MW. Iberdrola, Gamesa and Vestas are some of the companies that exploit Zaragoza power plants. It is important to mention also the firm TAIM-TFG, with headquarters in Zaragoza and devoted, among other activities, to the development, fostering and management of wind projects.

As a result of the fostering of eco-innovation policies, it can be stressed the projects of business excellence such as the technological innovation made by CAF company (with 1,000 workers), that has built the tram and is developing an important innovation in the system of charge by ultra-fast condensers allowing trams without catenary, protection systems against non-ionizing radiations and systems of preferential software in street-lights control.

(3) The municipal website includes in its Environment section updated information in the form of data, surveys and publications collecting the impact of the municipal policy and the habits of consumers and environmental companies.

Every concrete project produces an evaluation of the environmental results based on the reports and the communicative approaches.

(4) It is important to mention the passing of Zaragoza Open Government Strategy for the Digital City 2012-2015, with the goal of creating an intelligent citizenship and that includes the implementation of actions to foster eco-innovation and reduce consumption.

Among its actions:

introduction of eAdministration to reach ZERO PAPER

total renovation of public lighting using LED systems

development of solutions for an efficient use of private vehicles

launching of the Urban Milla Lab as a laboratory of R&D of the intelligent city and as a place for the development of joint projects of the administration, the citizens and the companies, with a specific working line on energy efficiency in cities

sensing of the elements of public thoroughfares for a better management by using IoT devices (Internet of Things).

installation of a system of intelligent irrigation.

The city of Zaragoza is a national and international referent and a model of a collective effort for obtaining an efficient use of water in all the social sectors. Zaragoza pools different public administrations and stands out by its experience for improving the quality of water and the reduction of its use. It is also the headquarters of research and training centres on water and energy efficiency with its acknowledged international experience.

Zaragoza city brand focuses on the efficient use of water, illustrated and reinforced by Expo Zaragoza 2008 on “water and sustainable development”.

Other contributors have been the critical mass of companies linked to the integral water cycle as well as the above mentioned urban cluster for an efficient use of water – Zinnae which fosters the innovative businesses and employment sector.

10C. Future Plans

Describe the future short and long term objectives to promote eco-innovation and sustainable employment and the proposed approach for their achievement. Emphasize to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

Make reference to:

- 1. Plans to establish eco-innovation clusters, strategies and initiatives to attract public-private partnerships for further developing eco-innovation and sustainable employment;*
- 2. Future targets of how eco-innovations can be applied by the city, e.g. make reference to share of hybrid or fully electric cars in total stock of the public fleet, or plans to support the infrastructure development for electric cars in public areas (i.e. increase the number of charging points for electric cars in public car parks);*
- 3. Participation at green business networks or partnerships and covenants and cooperation with knowledge institutions, such as universities;*
- 4. Programmes to reach the population and industries promoting green economy thinking.*

Eco-innovation activities are fostered by the following networks and working strategies:

- ✓ **EBRÓPOLIS** is the entity responsible for the **Strategic Framework Zaragoza 2020** and a meeting forum for private and public organizations. Its Sustainable City axis is working on:
 - **The consolidated city**
Zaragoza has adopted a model of urban growth using a double criteria: sustainable revitalization and development of neighbourhoods, and rounding off

of unfinished urban areas.

- **Zaragoza, city of water.**

Zaragoza will strengthen its “city of water” brand in collaboration with national and international research organizations, companies and citizens.

Zaragoza participates in two actions of the European Innovation Partnership-Water:

- *FINNOWATER - Innovative financial instruments and mechanisms to support public and private sector in water innovation.*
- *CITY BLUEPRINTS - Improving Implementation Capacities of Cities and Regions.* The project will establish a network of European cities for sharing their best practices on the services of the Urban Water Cycle.

Zaragoza participates in the project Water Efficiency in European Urban Areas (7th Framework Program), platform for boosting excellence and for an efficient management of water in the EU.

- **Sustainable mobility**

Zaragoza will deep in the reduction of pollution and in creating new urban areas for the residents by introducing rules on traffic, public transport, design of new vehicles, commuter trains and intermodality.

- **Sustainable management of the resources**

Zaragoza will deep into strategies for energy saving and consumption of resources, reduction of CO₂ emissions, improvement of the quality of air, recycle of waste, efficient management of water and fostering of renewable energies.

- **“Fostering activities on urban bare land”**

Zaragoza will introduce a strategy for a sustainable management of its undeveloped areas for protecting its farming land (orchards), and a management based on innovation and creativity.

- ✓ **AGENDA 21 LOCAL** includes an important fact, the introduction of a quality system (UNE 12001) in companies for saving water, paper and energy. The City of Zaragoza is developing the actions for the application of the European Common Indicator B7 in business organizations.
- ✓ **ZARAGOZA SMART CITY** is a strategy for obtaining a model of intelligent and sustainable city including resources for fostering environmental innovations of reference, among them the above mentioned technological improvements applied to the tram, the tele-management system of Valdespartera eco-city and its enhancement as a living-lab, the network of recharge points of electric vehicles and the installation of a system of intelligent irrigation by sensoring the supply network. These elements will continue to be developed after the launching of the Urban Milla Lad, integrated in Etopia centre of art and technology, an R&D laboratory of the intelligent city with a specific working line on energy efficiency in cities. These lines will also form part of the future projects of the Horizon 2020 program of the European Union.
- ✓ The integration of renewable energies in the urban fabric from a wind generator of small power (mini-wind) and photovoltaic generators in the existing elements of urban furniture can be stressed as a main innovation for the implementation in the next years of the **ENERGY STRATEGY 2020**.

As far as energy is concerned, the City collaborates with the University of Zaragoza through its **Research Centre on Energy Resources and Consumption**, fostering research projects by annual contests that contribute to consolidate Zaragoza as an international referent in sustainable energy.

- ✓ The strategy to be followed in the current decade integrates the commitments endorsed by the City as signatory of the **Pact of Mayor** in order to carry out its commitment to reach a reduction of a 20% of its CO2 emissions by the year 2020 as well as the goals of the **Directive 2009/28/EC** on fostering the use of energy coming from renewable sources.
- ✓ In the framework of the strategy for boosting employment and companies of added value of the environmental sector, it is important to stress the recently passed **LIFE+ projects** to be implemented in the period 2013-2016:
 - Orchards LIFE km0. This is a project for reaching the environmental recovery of the periurban areas of Zaragoza by actions focusing on the ecosystem and its organic farming. Its importance in creating employment is based on a new model of production from the activation of the eco-farming sector as well as the recovery of Zaragoza's fertile periurban land and the biodiversity of its flora and fauna.
 - LIFE ZARAGOZA+ NATURAL. This project focuses on the protection, improvement and value of Zaragoza Green Infrastructure, including LIC and ZEPAS, the green ring and other natural areas of interest which are very singular in Europe for being near a big city and by its good conservation state. The goal is to create productive models for the recovery and increase in value of these areas.
 - LIFE+ project and Parque Zero (being evaluated) will allow us to obtain a management model for the urban green areas by using a technological platform of experimentation addressed to companies, professionals and public services.

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