EnEf
Energy Efficiency in the Building Sector:
A Sustainable Future

REGIONAL REPORT
JUNTA DE EXTREMADURA – CONSEJERÍA DE FOMENTO
DIRECCIÓN GENERAL DE VIVIENDA Y ARQUITECTURA
EnEf Project

Regional Report

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INTRODUCTION

SPAIN

Spain is located in the Iberian Peninsula, in the Southwest of Europe. It has an area of almost 506,000 square kilometers including units and island regions and occupies a large part of the peninsular region together with Portugal, with which is bordered on the West. On the north, Spain borders with the Cantabrian Sea, France and Andorra; on the South with the Mediterranean Sea and the Atlantic Ocean, and on the West with the Mediterranean Sea.

Spain is divided into 17 Autonomous Regions; each one of them is divided in one or more provinces, 50 in total.

1.- PROFILE OF THE AUTONOMOUS REGION OF EXTREMADURA

1.1 Demographic aspects

The Population of Extremadura is composed by 1,107,220 inhabitants. It represents 2.36 % of the Spanish population (47,021,031). It has a population density of 27 inhabitants per km2, much lower than the average for Spain. There are two provinces within Extremadura, Caceres and Badajoz; both provinces are the biggest in Spain (in terms of area). Only three cities in the Region have more than 50,000 inhabitants: Badajoz, Cáceres and Mérida (the capital city), and apart from these only ten other cities exceed 10,000 inhabitants : Plasencia, Don Benito, Almendralejo, Villanueva de La Serena, Montijo, Zafra, Navalmoral de la Mata, Villafranca de los Barros, Coria and Olivenza.

The population from Extremadura has a significantly rural character. Only 26.25 % of the population lives in one the three cities with more than 50,000 inhabitants; and 44% live in cities with more than 10,000.

1.2. Economical aspects

Regarding economical activities, 57% of the economy of Extremadura corresponds to the services sector. The Construction industry and small and medium-sized enterprises (SMES) are the basis of an economy that is developing an incipient trade with Portugal, The economy in Extremadura maintains a high degree of tertiarisation due to the boom that Rural environmental and cultural tourism is producing in rural areas, traditionally people dedicated to agriculture.

In Extremadura there are around 8,000 industries; most of them are small and medium-sized enterprises. The main subsectors are energy, agribusiness, cork, ornamental stone, machinery and textile.

According to the Economic and Social Council of Extremadura, the labor market faces, especially in the current situation of economic crisis, new challenges. In this context, the labor market changes has to see, among others, with the diversification of the production, or the use of renewable energy that, in addition to be configured as reservoir of employment fosters the development of an economy more respectful with the environment.

Extremadura, is tolerating well some of the effects of the crisis, however, the weaknesses in its productive sector are also notable, such as the little development that the industrial sector has had in the region in favor of the farming and livestock sector despite that in recent years this situation has shifted positively;

With regard to the employment we highlight the high rate of temporary jobs, the unfavorable situation in the market of mainly women and young people in the region.

In addition, the Observatory of Employment of Extremadura has valued recently the development of green jobs in our community by providing the following data: 7,000 people are employed in these sectors.
By green employment is defined as one that is developed in the renewable energies sector, waste management, recycling, water purification, eco construction and auxiliary enterprises such as environmental consultancy, certifications consultancies and impact assessment and audits firms. Traditional sectors (agriculture, industry, construction and retail trade) also have a diagnosis and measures aimed at their empowerment and improvement.

In the field of energy, Extremadura produces four times the production of energy that it consumes, and it is expected that at the end of this year 2011 the 90% of electric energy consumption in the Region will come from renewable sources. The production of energy in Extremadura focuses primarily on the nuclear power and hydraulic, we do not have resources such as coal, oil, etc. In recent years, multiple initiatives in the field of renewable energies have been done, which have been translated

into the development and implementation of mini-hydroelectric plants, cogeneration plants, solar plants, biomass plants and thermo electric plants. Extremadura has already achieved by far the 2020 strategy for Europe, producing more than 20% of electricity consumed from Renewable energies decreasing more than 20% the CO2 emissions before the year 2020.

1.3. Social and cultural aspects

CULTURE

The autonomy of Extremadura and the integration of Spain into the European Community have produced a very important development in all social and economic sectors of the region where the interregional and international communications are more and more important; Communications systems adapted to the 21ST century are basic for a Region that for centuries has been isolated from the progress and development produced in other Spanish and European regions, Nowadays this situation is changing, one example of this is the construction of a high-speed rail line that will connect Extremadura with Madrid and Lisbon.

Extremadura has three places which have been declared as World Heritage by UNESCO:

- Old City of Caceres, since 1986
- Mérida archaeological site from December 1993
- Royal Monastery of Our Lady of Guadalupe, since 1993

In the same way Extremadura is preparing a candidacy for:

- The walled town of Plasencia
- The City of Trujillo
- Alcantara bridge
- The bastion buildings on the stripe between Extremadura and Portugal
- The Vía de la Plata
- The historical path of the Emperor Carlos I of Spain and Carolus V of Germany who came to Extremadura to spend his last days

EDUCATION

Education is one of the key pieces for the development of Extremadura. The educational improvements are perhaps the most important achievement in the past few decades in our region.
The educational progress in Extremadura has been, in addition, much more intense than in other regions. Extremadura is the region in Spain where the rate of student enrolment has increased the most and the second in the rate of adult literacy in the last decades.

The University of Extremadura was established in 1973. Its impact on the region has been of paramount importance for human capital formation and hence in the regional development. Currently this University has 10 university centers, and from its offer of studies we can highlight:

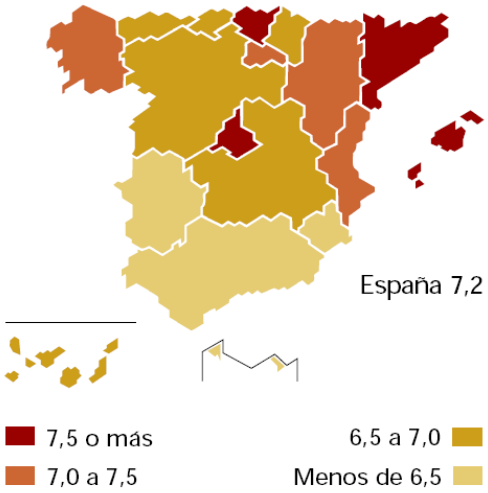
- Degrees: 55
- University Masters: 21
- Research Masters for scientists: 4

The number of students at the University is 9804 people (54% males and 46% females).

The University of Extremadura is strongly committed to the continuous improvement of the quality of its activities and the service it provides to society, both in the field of research with a search for the excellence of its groups as in the field of teaching, with an offer of training designed according to the criteria of quality and obtaining graduates well prepared to be inserted in the labor market as well as to undertake and generate wealth.

2.- PROFILE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE FIELD OF CONSTRUCTION

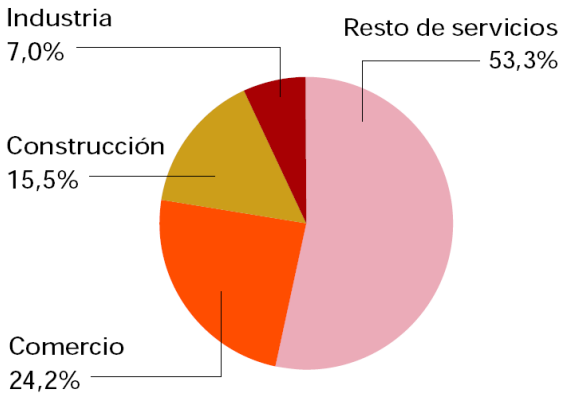
2.1. Construction Sector



Companies active for every 100 inhabitants at the state level

The construction sector, one of the fundamental pillars of the spanish economic growth of our recent history, has also had a determinative role in the extremaduran economy in the last twenty years

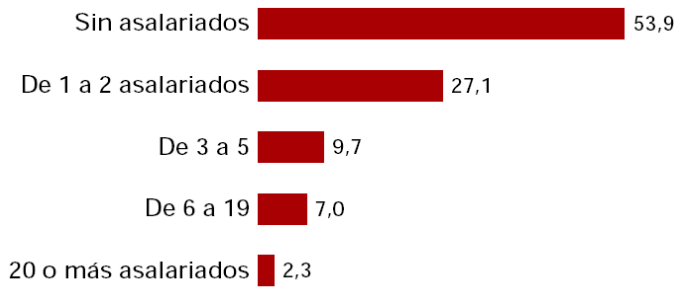
Turning to specific figures, in the mid-1980s the construction sector accounted for a 9% of total production in the region, in barely two decades its weight has increased considerably. In 2010, the construction sector, represented a 19% in Extremadura.



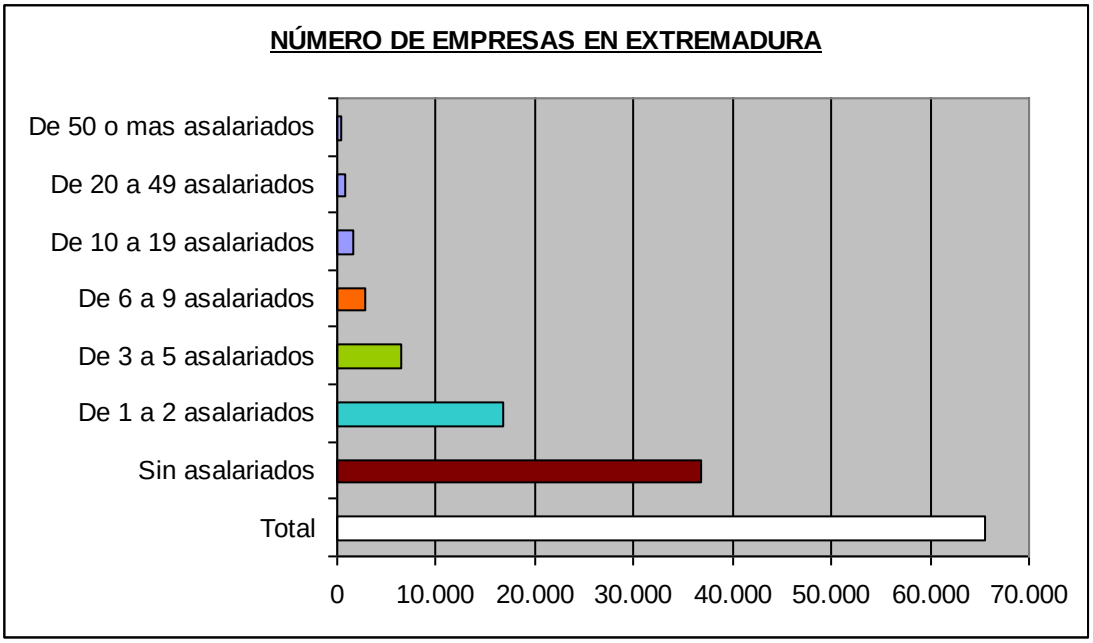
Distribution of the enterprise sector at the national level

The average of productivity in this sector in Extremadura is slightly lower than the average of productivity at national level, having increased this difference with the passing of the years. Hence the importance of improving this indicator, mainly through training, investment in research, development and innovation, and through the consolidation of the employment in the sector, with the aim of increasing competitiveness.

The total number of Spanish companies is 3,291,263. Only 2% of them are located in Extremadura. 56% of these companies in Extremadura do not have employees (apart from the owner), 25.56% of these companies have one or two workers; 15% of them have up to 10 workers, and 16% of the companies have more than 11 workers. These data gives us a vision of our reality.



Companies in Extremadura by number of employees (asalariados)



2.2 . Energy Efficiency in Construction.

Current legislation

The current construction is characterized by a problem shared by many European countries as is the low energy efficiency of the buildings. In this way the improvement of the efficiency can save a lot of the energy in Europe, and to reduce CO2 emissions, making Europe less dependent from the Energy point of view.

In this line, we should stress the importance of Spanish technical regulations (Technical Building Code) on the reduction of energy consumption in buildings by defining the energy performance that should provide the new construction of buildings and building reforms in Spain.

The technical Spanish regulations related to energy savings (DB-HE) has been taken into account in order to identify the different professional profiles involved in the installation of new building materials and construction systems.

DB-HE	Construction phases and elements
Limitation of energy demand	Walls
	Roofs
	Meeting points for construction materials and structures
Eficiency from thermal installations	Facilities of air conditioning (heating, cooling and ventilation) and hot water
Energy Efficiency of lighting installations	Indoors Lighting installations
Minimum Solar contribution to sanitary hot water	Installation of solar energy for generation of hot water

Taking into account the information obtained from the group of experts addressed for the needs of the training, it is considered that there are no new profiles, but there is a change in the way of doing things by the professionals who works in the field

It is necessary to develop two new fields of work in this industry such as energy audits and energy service companies.

The energy audit is carried out by a technician (industrial engineers and architects), together with a team of professionals performing field work. In this field work are reflected the required data that the auditor will

analyze. The audit will make the diagnosis and propose more appropriate constructive solutions.

Maintenance is another important area for the generation of new jobs. The
Objective of this field of work is to improve the efficiency of the facilities with connection to lighting, air-conditioning, ACS and home automation. Nowadays Collective Facilities are constructed again because they present better energy efficiency. These Facilities need a continuous maintenance

There is still a lack of knowledge in Extremadura and in Spain on good practices in the implementation of new efficiency energy facilities in buildings such as solar thermal systems, small wind systems, solar photovoltaic systems, biomass boiler systems, geothermal systems, etc.

It is also clear from the studies carried out that in many cases the update of the skills should not be exclusively related to the implementation of the Document for energy savings, but also the public health standards and protection against noise.

2.3 . Current Situation of the training offered in energy efficiency.

The greater part of the available training offer existing in this field of energy saving according to the Technical Building Code has been targeted to the qualified technical responsible for the project.

According to data from the training plans carried out since 2007 in the Foundation for Construction, the training offer for the staff who work in the field has increased in recent years significantly. The students have been involved mainly in rehabilitation (refurbishment) construction courses and sustainability courses.

We can say that new professions are going to be demanded for this industry such as technicians in renewable energies for the edification and professionals for the control and energy certification of buildings.

Within the construction industry, all occupations, in general, will suffer modifications in order to improve the production and increasing the professionalism, however, the occupations that need greater update in this area and that need specific training are:

- Responsible for work in the building site.
- Bricklayer
- Plumber
- Installer for heating, hot water systems and air conditioning
- Gas systems installer
- Technician for quality and environment control
- Electrician
- Insulation Installer

These occupations require new or updated skills to ensure that the demands on energy saving, insulation of the housing and energy efficiency are carried out in accordance with the requirements of the current regulations.

It is necessary to stress the necessity of monitoring the work along the building process to ensure the correct installation of isolates, avoid losses and the implementation of solutions and materials.

It is necessary to have professionals capable of planning and carrying out the project previously designed, optimizing the production processes. The professionals who carry out the implementation must know how and why of every part of their work.

Regarding the use of home automation systems, they have become very popular in new building, therefore new installers well trained are required for the correct installation of the systems.

Experts reveal the need to perform the training of professionals from a basic training, with a basic knowledge of the work and working site. Knowing the the work that is carried out and its pourpose.

Training for employment must have as its main objective the recycling and adapting of professional profiles to the reality of the current constructive process.

Recycling and upgrade are imperative. The update in terms of new regulations, knowledge of new materials, and knowledge of innovative processes that are carried out in companies. This is the way in which trained professionals are aware of the reality of this industry.

2.4 . Challenges and opportunities of small and medium-sized enterprises

The study on companies, concludes that it is necessary to carry out courses which must addresto all SMEs with the aim that they know "to sell" the profitability of investments in energy improvements and, also, to prevent the introdution into a new type of business without the necessary knowledge of the margins and costs, arising in a negative economic situation for the company.

Energy efficiency is one of the areas with better prospects for future economic perspectives and growth, either by the building of new construction, which has to comply with the requirements contained in the CTE, or the needs resulting from the energy rehabilitation of the Spanish housing state.

Therefore, in order to achieve a sufficient number of workers prepared to carry out these tasks it is necessary to undertake two indispensable performances: the update or redesign of the educational offer; and to rise the qualification.

In conclusion, there are a multitude of qualified professionals to perform the tasks and activities related to energy efficiency that cannot fully develop those activities, since they do not have a formal accreditation to demonstrate their competencies, a situation which significantly limits its capacity for action.

In this sense, it would be necessary to promote the opening of assessment procedures of professional competencies in this field that will enable the accreditation of qualifications for these workers, acquired either through work experience and/or non-formal training.

This action will encourage the "bloom" of these qualifications hidden and, therefore, will allow the recovery and retraining of a vast number of professionals perfectly qualified to undertake such activities

3. PRELIMINARY RESULTS

Improving the energy efficiency of the existing stock of buildings and the creation of new neighborhoods and eco-buildings will require construction efficiency and quality in the coming decades, not only by taking into account the regulatory obligations, but also by the chance of energy and costs saving in contrast to the rises in the price of primary energy, the improvement of the urban heritage and the quality of life.

In addition to the adoption of new materials and construction systems that offer high value-added at a good price, it is necessary that the new processes of implementation and the rules of quality in construction are sufficiently known by the professionals of the construction industry.

In addition, and no longer only for reasons of environmental sustainability but for economic and social sustainability, it is necessary the people and businesses to be highly competitive in advanced technologies and processes, with the aim of producing goods (buildings) and services (maintenance, audits, and energy management, etc) sufficiently sophisticated to have acceptance in the market.

The level of qualification of citizens and professionals from all over the country is essential to meet the challenges of our time, when there is a growing relation between access to knowledge and the production of wealth.

The formation and training of professionals in the construction is key to improving the constructive model of this industry, its image, and to provide highly competitive products on the domestic market and abroad.

Within the construction industry, the proceedings are to be implemented on five main actors:

- The promoters of building construction (public and private)
- manufacturers of products and construction materials
- The designers and authors of projects
- The specialized and generalist builders.

For carrying out these actions, we need to establish collaborative dialog between these actors surpassing the traditional sequential process.

The sub-industry of rehabilitation (refurbishment) acquires great importance and it is foreseen as the 25% of future construction activity in Spain. The technological innovation, energy efficiency, sustainability and the industrialization of the construction industry are gaining more and more importance.

Rehabilitation and Energy efficiency are critical to expand the number of skilled professions. It must be taken into account that the qualification will be one of the most important assets of the company in the future. Therefore, there is a need for investment of effort in training from companies, public administrations and workers.

4.SURVEY FINDINGS

- In general, it is considered necessary to comply with regulations on energy efficiency; this will improve the quality of the offer in the market. The respondents do not have a clear strategy to know if energy efficiency is demanded by potential clients and the real economic profit that energy efficiency could bring. They demand training to know how to implement a good strategy to be more efficient and to obtain more benefits regarding energy efficiency. They know about the existence of grants

- In general, most of the respondents use insulation, energy efficient glazing, heating systems, solar passive measures and the use of heat lamps, and building materials.

- Regarding energy efficiency in boilers, automatic controls, heat recovery systems, geothermal systems, pellet burners, wind turbines, and smart meters, we can conclude that if the respondents had more knowledge of them the majority would use them.

- Companies are very interested in the commercial benefits provided by energy efficient products.

- Companies are very interested in learning more. mainly in the regulation, development of business plans on new trends, marketing and procurement of energy efficient products and services.

- The companies believe that self-managed training courses on-line would allow them to consider the use of building systems and products.

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5.2. Collaborations:

- Colegio Oficial de Peritos e Ingenieros Técnicos Industriales. Cáceres y Badajoz
- Colegio Oficial de Ingenieros Industriales de Extremadura. Cáceres y Badajoz
- Colegio Oficial de Arquitectos de Extremadura (COADE). Cáceres
- Colegio Oficial de Aparejadores y Arquitectos Técnicos. Badajoz y Cáceres
- Confederación Regional Empresarial Extremeña. Badajoz
- Confederación Organizaciones Empresariales. Badajoz
- Federación Empresarial Placentina. Plasencia
- Federación Empresarial Cacereña
- Pequeña y Mediana Empresa de la Construcción (PYMECON). Plasencia.
- Federación de Empresarios de la Construcción. (FECONS). Cáceres
- Asociación de Empresarios de la Construcción (APROCON). Don Benito

- Asociación Provincial de Empresarios de la Construcción de Badajoz (APDECOBA)
- Consejería de Igualdad y Empleo. Dirección General de Formación para el Empleo.
- Servicio Extremeño de Empleo (SEXPE). Junta de Extremadura
- Fundación Laboral de la Construcción

5.3. Companies participating:

37 companies collaborating from the construction industry in Extremadura