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## **Climate Change, Employment and Local Development in Extremadura, Spain**

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# Climate Change, Employment and Local Development in Extremadura, Spain

A review by the Local Economic  
and Employment Development (LEED)  
Programme of the Organisation for  
Economic Co-operation and Development  
(OECD)



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## *Foreword*

In the early 1990s, the OECD Local Economic and Employment Development (LEED) Programme produced a series of working papers analysing the relationship between employment, the environment and local development issues. Indeed, LEED's research showed that while introducing new environment protection regulations may lead to the closure of polluting factories, increasing unemployment in the short-term; in the medium-term of 6-9 years, this would lead to the creation of cleaner and more technologically-advanced jobs.

At that time, climate change was not the pressing issue it is today, but evidence was already showing that the traditional economic model was unsustainable and that it would, over time, lead to a reallocation of labour and jobs. Today, the debates around environmental sustainability and job creation have taken on a global dimension, creating uncertainty at the local level.

The OECD project on “Climate change, employment and local development” was conceived in the aftermath of the Copenhagen conference in 2009 and the assessment of progress made since the adoption of the Kyoto Protocol. Climate change is a reality now. The majority of countries have made ambitious commitments to mitigate climate change and to adapt to the new environmental conditions while continuing to combat the job crisis.

LEED is a platform where governments at national and local levels come together and share practices and policy approaches on local economic and employment development issues. With almost 30 years of experience in policy analysis, LEED is well positioned to provide guidance and policy recommendations to public authorities on how to define and implement a new policy agenda that takes into consideration the economic, social and environmental aspects.

Extremadura has been a precursor in understanding the opportunities arising from moving towards an economic model that decouples economic and environmental performances. Despite the economic and financial crisis, the region engaged in a very demanding OECD exercise that implied the assessment by an international expert of the policies and programmes in

place to support employment and local development in the region in the context of the transition to a greener economy. The various political and social actors approached were very supportive of this project, and the OECD benefitted from their insights all along the process.

The natural heritage of Extremadura and the state-of-the-art centres dedicated to energy and outdoor sports, among others, provide the region with a set of assets that can serve as a solid basis for job creation if the sustainable agenda is defined and implemented appropriately. The partnership with Extremadura has brought to the LEED Committee an inspiring model of approaching growth and job creation in an innovative and “green” way. The analysis in this report offers an illustration of the approaches successfully undertaken in Extremadura towards employment and local development in the green economy, and it also identifies alternative ways of creating greener jobs in the region.

This project is the core contribution of the LEED Committee to the OECD Green Growth Strategy. It is being matched and coordinated within the OECD Secretariat with the project “The Production of Renewable Energy as a Regional Development Policy in Rural Areas” carried out in Extremadura by the OECD Directorate for Public Governance and Territorial Development. The project is being developed by Gabriela Miranda, LEED Policy Analyst. It has benefitted from the participation of Extremadura (Spain), London (UK), Sydney (Australia), Podlaskie and Pomorskie (Poland) as well as the European Commission. The findings of the various case studies will be synthesised in an OECD report that will be finalised by the end of 2011.

I am confident that this work will provide a valuable contribution to Extremadura, Spain and other OECD countries that are looking at alternative ways to achieve economic growth using innovative approaches to the economic, social and environmental challenges that are omnipresent in our economies today.

A handwritten signature in black ink, consisting of a large, sweeping oval shape with a vertical line through it and several horizontal strokes below.

Sergio Arzeni

Director, OECD Centre for Entrepreneurship

Head, OECD LEED Programme

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Mr. Gabriel Cabrera from Atriex was fundamental in facilitating the discussions during the study visit as well as in translating this report into Spanish. Ms Arielle Delteil-Dove edited chapter 1. Ms Michela Meghnagi and Mr. Damian Garnys from the OECD Secretariat provided very valuable contribution in the preparation of the charts and the analysis of the survey data. Mr. Peter Vogelpoel formatted the report.





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## Executive summary

Extremadura is the fifth largest region in Spain, with certainly one of the most diverse eco-systems and abundant natural resources. With the creation in 2009 of the *Regional Strategy to Combat Climate Change*, Extremadura launched a series of initiatives to facilitate the transition to a green economy which means a model that takes into consideration economic, social and environmental aspects with one core objective: create jobs. These initiatives sought to make a better use of the assets in the region while mitigating climate change and creating job opportunities for the population. Some 3 000 jobs were created in one year time in the renewable energy sector which was the central economic sector of the Strategy. However, the largest share of jobs in renewables is in short to medium-term. Long-term employment can only be ensured if Extremadura provides the right framework to make the best use of the human capital (skills) available across the regional economy.

How can Extremadura exploit its capacities to broaden the employment basis while moving to a green economy? What actions and priorities should the regional government take into account to move an economic development and employment agenda forward in this new context? How can Extremadura pursue its efforts to remain one of the least polluting regions in Spain while supporting job creation? Which are the economic sectors with potential for job creation in Extremadura? This study sought to provide guidance and policy recommendation to Extremadura on these and other issues related to the transition of the labour market to the green economy.

In particular, the study examined the impacts of climate change (including through its effect on policy and regulations) on the local labour market, with a focus on the creation of jobs and the development of a skilled workforce to meet the needs of the greener economy. The study looked at the programmes and policies affecting the labour market and at their impact on industry and the regional economy in general. Key economic sectors were analysed, from tourism to construction and agriculture, while potential new sectors were explored. Two surveys, one addressed to businesses and a second one to public institutions, support the findings and evidence gathered during the study visit.

## Main findings

The analysis of Extremadura shows that the region has an enormous potential to support economic activity and job creation in traditional sectors, while contributing to mitigating climate change and complying with regional, national, and international sustainable agendas. Extremadura has already an advanced knowledge in various areas of work within the green economy as well as several assets in the region. The regional government could further develop these and position itself as a national and world reference if an effective support scheme is pursued successfully. The key challenges and opportunities for the region that emerge from this report are listed below.

### *Opportunities to seize*

*Natural heritage.* Extremadura benefits from vast natural resources that attract tourists but is also space for agricultural and forestry activities. Natural resources could become learning environments, opening up considerable opportunities for workforce development, skills updating and upgrading in bio-agriculture, renewable energy production, and eco-tourism. Moreover, traditional working processes and techniques, like those used in agriculture and architecture, could be sources of well-rooted if organised and supported effectively.

*Renewable energy is promising.* Renewable energies such as wind and photovoltaic power will certainly contribute to promote economic growth and job creation in the short and medium term. The region has well-established networks such as the Energy Cluster and the Science and Technology Park (STP). The planned Iberian Centre for Renewable Energy will be located at the STP, further enhancing the region's capabilities. Partly due to ongoing training programmes, the region has an excellent supply of labour with skills in renewable energy that could meet any emerging demand.

*Strong local capacity.* Many successful projects and positive experiences were identified across the region. The network of 210 Employment and Local Development Agencies as well as the Extremadura Public Employment Service (SEXPE)'s 41 offices allow the proximity required for reaching out in a vast and sparse region like Extremadura. Projects like EFIMEX showed that the region can offer practical solutions and answers to real problems. Likewise, the Scientific and Technological Park provides the region with quality services and vision for greening skills. And innovative and state-of-the-art infrastructure like *El Anillo* offers multiple possibilities to expand new areas of work in the region.

*Social dialogue and democratic participation.* The recent signature of the Social and Political Pact of Reform by the regional government and unions indicates a willingness to work together. The various economic and social

actors are thus well aware of, and involved in, the definition of the political and economic agendas for the region. This incipient capacity building effort should help the regional authorities to gain consensus and gather evidence to support its decisions towards a green agenda.

*Experience in green skills training.* Through the renewable energy training programme by the Extremadura Public Employment Service (SEXPE) there is a basis of existing institutional good practice on which to build a skills and training policy at the regional scale. This may provide the opportunity to create a permanent training centre for green skills development to improve the skills response.

*Proximity to Portugal.* Extremadura benefits of very good relationships with Portugal, sharing physical and cultural assets. The creation of the first international natural park (Tajo-Tejo) will be a great opportunity for Extremadura to position itself in an international scene. This project has the potential to attract investment and tourists, and promote research collaborations.

*Management of natural spaces.* The region already has a high concentration of jobs in the area of management of natural spaces. The need for environmental management and interpretation will increase due to the creation of the international Tajo-Tejo Park as well as to the increasing demand for eco-tourism in the region and across the country.

*Greening the VET System.* The use of existing instruments like the “Escuelas Talleres” to green the VET system could become a learning model for enhancing young people employability if they integrate local resources and heritage, developing green awareness, acquiring knowledge and techniques for jobs in the fields of plumbing, masonry and renewables with a green component.

*Agriculture and forestry.* Extremadura is extremely well-placed to capitalise on these sectors given the significant extent of agricultural land in the region. There is an opportunity to supply new agriculture products to green sectors – for example the supply of biomass crops and biofuels to the biomass sector. The deployment of biomass installations in the region and elsewhere in Spain will create a demand for the supply of feedstock.

*Organic food market.* Extremadura has an important production of high quality food products that can be processed, “branded” and exported to both the rest of Spain and overseas. Indeed, agriculture and food production are important within the region, but little or no value is being added to these products locally. The extension of the land and the know-how of the population offer a great opportunity for Extremadura to compete in the food market. There is scope to develop strategies based around local food production and marketed on a “green”/organic premium.

*Outdoor sports reference.* The development of the outdoor sports centre *El Anillo* provides an opportunity as a location for research and company formation. The Centre also has a potential national role as a focus for outdoor sports training. The Centre may also be useful as a promotional tool for quality of life for creative workers.

*Eco-industrial development.* Ecoparks are currently based around solid urban waste management, but could offer the potential to handle other forms of waste treatment and recovery as well as opportunities for some form of eco-industrial development. An eco-industrial development might also have potential if linked to some of the existing biomass initiatives for energy where agricultural waste (e.g. from tomatoes, olive cuttings) forms an input for energy or biodiesel production.

*Link cluster activities.* There is a potential leading role for the Energy Cluster by linking into other sectors and acting as a champion for energy efficiency across the region and Spain. Maximising the potential of the Energy Cluster could lead not only to strengthening the position of Extremadura as a leader in the energy sector, but also to stimulate enterprise creation and jobs in the energy sector.

### **Challenges ahead**

*Lack of awareness.* There appears to be a disjoint between “green” and “economy” within the region, with many business people stressing the administrative burden associated with the environment constraints, whilst failing to identify the associated economic opportunities. SMEs in Extremadura do not currently see the environment as a priority or more importantly as a market opportunity. There is a substantial amount of work to be done to obtain active engagement with the green economy agenda mainly by entrepreneurs in Extremadura and to make them aware of the business opportunities involved.

*Green entrepreneurship.* There is some support to business development in the green industry, but it is not easily accessible to entrepreneurs. There was little evidence of firms involved in programmes such as EFIMEX or others, subsequently engaging in the development of new ideas and innovations. Moreover, there remains a need to improve the entrepreneurial capacities in the region, support entrepreneurship development and provide customised training. There is space to invest in eco-innovations (technological and non-technological) and to stimulate collaborations between different key actors in the region to enlarge the green business base.

*No skills identification.* Whilst the region has some excellent skills and expertise in green economy activities, these are poorly recognised or articulated. Due to the large share of SMEs, most firms cannot afford to undertake internal identification of skills needs. There is a need to strengthen coordination between



social partners, private training centres and the public sector to identify skills needs (skill audit) and to provide SMEs with the training they need.

*Limited contribution from the university.* There is a limited joint working between the university and other public sector partners and industry. The university offer and expertise is not sufficiently aligned to the needs of the Extremadura economy in general and less so to the new demands of the green economy. All of this hinders the expansion of added-value sectors in the region and limits the up-skilling of the workforce in Extremadura in the right direction.

*Fragmented training provision.* The training provision in Extremadura is extremely fragmented. While local actors provide quality training and information, they do not act co-ordinately and this brings about a number of weaknesses in the system: confusion among businesses and workers, scarce reliability of the system, waste of resources, and ineffective use of the existing potential, resulting in a jeopardized impact of public labour policies.

*Traditional training methods.* Training supply in Extremadura is based on learning inputs, far from a learning outcomes approach and their evaluation. This reflects the prevalence of traditional didactic methods (in-class, courses, etc.), and the absence of learning in the workplace, in the natural environment, and using new training formulas (short courses, e-learning, self-training, etc.), which are advisable especially when it comes to rapidly changing technological fields and jobs, such as green ones. Also, trainers are often unprepared to meet the challenges of greening the workforce and their skills.

*Lack of governance.* There is a lack of coordination and collaboration between public sector bodies and the private sector to anticipate skills gaps. There is also a lack of policy integration between different environmental, employment and skills development policies as well as in the whole area of renewable energy policies, where there is a need for much greater integration of activities. Frequent changes to strategic direction (long term) and support tend to discourage commitment by other actors.

*Limited institutional capacity.* Many of the local institutions (local development agencies, training centres, employment offices, etc) have neither the capacity nor the trained personnel to advise firms on green opportunities and green skills/training available. The same institutions indicated that they find it difficult to define the business needs and believe that they do not offer services that meet the growing “green demands” of the businesses. Overall, public institutions do not seem to have the capacity to respond to the new demands of the businesses and provide quality advice to promote the green economy.

*Lack of innovative activity and green entrepreneurship.* Despite some efforts identified to shift the region away from an agro-industrial base towards more competitive and innovative sectors, there is a lack of innovative activity that hinders this transition. More efforts are needed to create a culture of

entrepreneurship and innovation in the region to foster business activities based on close collaboration with social partners such as University of Extremadura.

*Too much focus on renewables.* Extremadura has great potential in renewable energy, and local businesses and policymakers are working hard to capture new jobs in this sector. However, renewable energy should not be supported to the exclusion of other sectors which also have growth potential and can create long-term jobs. Furthermore, there is a risk that the region fails to capture the economic benefits if the supply chain in the sector is not ready to absorb the demand.

*Risk of “green washing”.* There is a risk of “green washing” that is to say false claims of environmental virtues by companies, training providers, policy makers or NGOs, aiming at the creation of a positive image of their goods or services, which look more environmentally-friendly than they really are. By defining what makes a curriculum or a training programme or a product greener, it would be possible to certify it. The economic, social and environmental components of the “green” certification should be spelled out.

*Bubble of “green training”.* Training should be integrated with placement and other auxiliary services for managing the transition to a green economy, in the perspective of an integration between education, the training system and the labour market. The Pact for Professional Training in Extremadura, signed recently by the regional government and the main economic and social actors, is already contributing to the adaptation of the regional training offer to the concrete needs of enterprises in sectors related to “green jobs”.

*Restrictive building codes.* The current Technical Building Code appears to encourage the installation of certain kinds of green technologies (e.g. solar energy), but inhibits the use of existing traditional building techniques which are well-embedded in the region and can be a source of local jobs. These may therefore be disadvantaged or positively discouraged as an unintended consequence of current policy choices.

## **Policy recommendations**

The analysis above provides a basis for a set of policy recommendations to support the transition towards a greener economy while creating jobs and supplying the skills required. Some of the policy recommendations are illustrated with practical examples (learning models) from approaches adopted in other regions across the OECD. The learning models can be found in the annex. The main policy recommendations have been condensed in the list below under each of the four chapters of this report. The details and analysis of each of them can be found in the report.

### ***Economic and labour market***

This chapter argues that green growth in Extremadura can be a policy direction to create business and jobs opportunity in the region, while at the same time to sustain natural repository. To make the reform possible and elaborate a long term strategy which is supported by strong policy leadership, active partnership and rigorous entrepreneurship will be necessary. The main recommendations emerging from the analysis are:

- Show a strong policy leadership
- Streamline and interlink green efforts
- Form strategic partnerships with other countries or regions
- Create a flagship and promote the region
- Attract investments to the region
- Build up green infrastructure
- Invigorate green entrepreneurship

### ***Greening jobs in Extremadura***

This chapter focused on the potential to create new “green jobs” as well as to “green” the existing jobs in Extremadura. The chapter presents a base-line analysis of the number of green jobs in Extremadura and Spain, based on existing research, followed by analysis of trends in a number of sectors, considering the extent to which the labour market impacts of the growth in the green economy are already taking place, and the potential for further change. This chapter concludes with the following policy recommendations:

- Develop common vision for the Green Economy
- Be the national leader on updating job-profiles
- Create a regional renewable energy strategy
- Establish permanent renewables training centre
- Supply chain development
- Biomass sector development
- Public sector lead on energy efficiency
- Promote energy efficiency improvements in the private sector
- Support waste management development

### ***Developing green skills in Extremadura***

This chapter analyses the situation of Extremadura in the context of the development of green skills to meet the demands of a greener labour market. The chapter analyses the initiatives for green skills development put in place in Extremadura, the state of the workforce and of the initiatives for its green development, the expected changes in job profiles and new skills needs, as well as new green skills' demand and supply. After this analysis, the chapter concludes with policy recommendations to tackle the mismatch of skills in the green economy in the private and public sector. The following policy recommendations emerge:

- Carry out skills needs analysis (skills audit)
- Undertake actions for adult learning
- Provide more learning options and better articulation of training supply
- Introduce greening at early stage education
- Define criteria for “green” training
- Train managers in the public and private sectors
- Pursue social dialogue for greening skills
- Develop a strategic public-private partnership
- Create posts for networking environmental managers

### ***Enable green growth in Extremadura***

This chapter analyses the governance of the green economy in Extremadura. In particular, the chapter looks at the need for policy coordination, policy delivery arrangements, the integration of policy across institutions, and the mechanisms to adapt the local labour market to the green economy. The chapter identifies a series of barriers to green growth as well as key economic sectors to further develop the green economy in Extremadura. The main policy recommendations are:

- Lead by example, systematise green procurement
- Consider developing an industrial symbiosis project
- Review your brand and focus your labels
- Make the most out of “El Anillo”
- Make a better use the “Hospederias” brand

- Link up the Energy Cluster to develop critical mass
- Support the traditional building sector
- Balance eco-tourism development and conservation
- Develop eco-tourism activities
- Support added-value activities related to the environment
- Support the production, process and export of organic food
- Link up food-related policies with local eco-tourist initiatives
- Create networks in the energy sector
- Make a greater use of the diaspora



## *Introduction*

Among OECD countries, green growth is gaining support as a way to pursue economic growth and development, while preventing environmental degradation, biodiversity loss and unsustainable natural resource use. For the OECD, green growth implies decoupling economic and environmental performances, as well as making investment in the environment a driver of economic growth (OECD, 2010). Climate change is a reality now, and countries have to face several challenges to adapt and mitigate its effects on the economy and the employment base.

Spain faces a number of challenges due to global warming and climate change: predicted future effects include a decrease in available water resources, increased desertification, increased temperatures, increased fire risk, and an increase in extreme weather events among other direct effects. Spain and its autonomous communities have to adjust to these new conditions that may affect key economic sectors such as energy, tourism and agriculture.

At the same time, Spain and its autonomous communities have to deal with the definition and implementation of policies and regulations aiming at mitigating climate change by reducing emissions of greenhouse gases and minimising its contribution to global warming. These indirect impacts of climate change will have an effect on the labour markets and the economic fabric.

In recognition of these factors and in the face of the current economic climate, the regional government of Extremadura is promoting the transition to a sustainable, green economy, trying to make the best use of its own assets and capabilities. The Extremadura authorities are putting in place a series of policies and programmes to cope with climate change effects while supporting job creation and economic recovery.

Alongside this, at the OECD Ministerial Council Meeting in June 2009, Ministers acknowledged that green and growth can go hand-in-hand and adopted the Declaration on Green Growth. At this occasion, Ministers asked the OECD to develop a Green Growth Strategy to provide guidance and recommendations on the programmes and initiatives required to facilitate the transition to a green economy. In developing this strategy, the OECD Local Economic and Employment Development (LEED) Programme proposed a number of expert study reviews of OECD members regions (including this

review on Extremadura, Spain) to examine the impacts of climate change on labour markets and local development.

There are a number of ways in which climate change can impact on the economy and on labour markets:

1. Direct impacts of climate change on economic activities – *e.g.* due to changes in climatic conditions and the occurrence of climatic events
2. Indirect impact of climate change through new policy and regulations, affecting supply (enterprises) and demand (consumers)
3. Impact of the climate change debates on social conscience leading to a raise of awareness of sustainability. This “green” social conscience then drives policy, regulations, consumer choices, and therefore labour markets

Whilst the first factor is potentially significant in the medium-long term and may affect some key economic sectors in Extremadura such as agriculture and tourism; the primary focus of this study is on the second factor – in particular to identify and analyse the policy options available to the regional government of Extremadura to maximise the economic opportunities arising from climate change, and minimise any adverse impacts on the economy and the jobs base.

The Extremadura expert study reviews have been arranged around four thematic areas:

1. Labour market issues
2. Greening jobs
3. Developing green skills
4. Enabling green growth

Two surveys were prepared for the purposes of this study. One was targeting the businesses in Extremadura. A second survey was distributed to institutions in charge of providing training schemes or employment programmes in order to understand the changes in the demand of this kind of services. These two surveys gathered evidence on the impacts on jobs and skills requirements in the labour market from the transition to a green economy. The surveys were distributed by the local development agencies network of Extremadura.

A one-week study visit to Extremadura was organised to deepen the understanding of the challenges and opportunities that are arising for the work of public services. The study visit took place from 21 to 25 June 2010 in the city of Mérida. The aim of the study visit was to confront the preliminary results of the surveys and the diagnostic analysis of Extremadura with key economic and social players in the region. The study visit was also the



occasion to gather evidence of the challenges and opportunities for job creation and economic development in Extremadura in the context of the transition to a green economy. The study visit included a series of meetings with stakeholders from the public and private sectors in Extremadura, as well as other organisations involved in workforce and economic development.

The review panel was formed by three international experts and two OECD Secretariat. This report has been prepared under the supervision of Gabriela Miranda from the OECD Secretariat, who has also put together the report. The survey analysis and chapter 1 were drafted by Prof. Carlos Ongallo, Employment & Business Office Director, University of Extremadura. Chapter 2 was prepared by Mr Hyoung-Woo Chung, Senior Policy Analyst, Division for Employment Analysis and Policies, OECD. Chapter 3 was drafted by Mr Richard Howard, Analyst of DTZ Consulting in the UK. Chapter 4 was prepared by Ms Lisa Rustico, research fellow at the Department of Economics of the University of Modena and Reggio Emilia, Italy. Finally, chapter 5 was drafted by Prof. David Gibbs, Department of Geography, University of Hull, UK.



## *Chapter 1*

### **Extremadura in the green economy**

by Carlos Ongallo

*This chapter presents a background analysis of the region of Extremadura, including economic, social and employment facts. A description of the key institutions involved in the green economy agenda in the region is provided. The chapter concludes with an overall SWOT analysis of the region. This chapter served as diagnostic report for the international expert team, in preparation of the study visit.*

## Analysis

Extremadura is one of 17 autonomous Spanish communities located in the south-western portion of the Iberian Peninsula. Extremadura is the fifth largest region in Spain (41 634 km<sup>2</sup>) and includes two provinces, Badajoz and Caceres, which have 164 and 219 municipalities respectively.

Following the economic crisis of 2008, which hit Spain particularly hard, the regional government of Extremadura decided to invest in the development of a “green economy” to counter its effects. In line with international environmental preoccupations, such as global warming and the Kyoto Protocol and national objectives such as the Renewable Energies plan for 2011 to 2020 established by the Spanish government, Extremadura has taken these objectives very seriously with the creation of the *Estrategia Extremeña de Lucha contra el Cambio Climático*, approved by the regional government in 2009.

Through legislative changes facilitating the growth of green sector employment, this region has seen an increase in job creation with about 3 050 people working in renewable energies in 2010. Those numbers are expected to double in the next year. The renewable energy sector is seen as a niche of employment, but is not the only area of the green sector that is creating jobs. Water and waste management have over 2 000 workers, green construction has 1 100, and 1 250 are employed in other related areas. While taking into account the geography and demography of the region, the government of Extremadura has sought to develop green sector jobs and new opportunities for its population.

## Geographical situation

Extremadura borders Portugal to the west, Castilla La Mancha to the east, Castilla y León to the north and Andalucía to the south. Extremadura’s landscape is made up of the *Sistema Central* (central system mountain) which rises to the north, composed of the Sierra de Gredos and the Sierra de Béjar (where Extremadura reaches its highest peak in Calvitero at 2 401 meters) and the Sierra de Gata, which separates Extremadura from the region of Castilla y León. In the centre there is the Sierra de Villuercas, the Sierra de Montánchez and the Sierra de San Pedro which is a part of the Montes de Toledo. Extremadura is separated to the south from Andalusia by the Sierra Morena.

The existence of a complete network of reservoirs and dams, with a capacity of 19 639 Hm<sup>3</sup>, allows the autonomous region to develop the energy and agricultural potential offered by its natural environment. According to official figures, Extremadura reservoirs are currently at 90.74% of capacity due to the winter rainfall, more than 20 percentage points above the average of the last ten years.<sup>1</sup>



Source: <http://cookinginspain.files.wordpress.com/2010/02/extremadura.jpg> (fecha 17/09/10).

There are four rivers in Extremadura, all of which run into the Atlantic Ocean:

- The Tagus River has two main tributaries, to the right the Tiétar and Alagon, and to the left the Almonte, Ibor, Salor and Sever rivers. Water is very abundant in the right tributaries, which are fed by the gorges of the Sistema Central.
- The Guadiana River's main tributaries are the Guadarranque river and the Rucas river to the right, and to the left, the Zújar (its abundant tributary) and the Machel.
- The Guadalquivir river ( the longest river in Spain after the Tagus),
- The Duero River.

There are three National Parks in Extremadura, the Monfragüe National Park, Cornalvo Nature Park and the International Tagus Natural Park. There is also the Gorge of Hell Nature Reserve, in the Jerte Valley which extends over 6 927 hectares.

The Autonomous Community has protected landscapes like the ones cited above and Valcorchero and Gordo Mountains in Plasencia, natural monuments like Mina La Jayona (Badajoz), Los Barruecos in Malpartida de Cáceres (Cáceres), Fuentes de León Caves (Badajoz) and Castañar Cave (Caceres); and areas of regional interest such as Llanos de Cáceres, the Large Mountains in Hornachos (Badajoz), San Pedro Mountains (Badajoz-Cáceres),

Orellana reservoir and the Pela Mountains (Badajoz), Tierra de Barros (Badajoz) and Tentudía Mountains (Badajoz).

Extremadura is characterized by hot and dry summers with occasional rainfalls, and precipitations the rest of the year. Extremadura also has long winters, which are often softened due to its proximity to the Portuguese Atlantic coast.

Extremadura has a very extensive road system, with two highways: the A-5 (or Southwest Highway), which covers the region from east to west linking the two capitals of the Iberian Peninsula: Madrid and Lisbon; and the A-66 (or Plate Highway), which runs from the north to the south parallel to the Portuguese border. These are complemented by regional highways that connect major population centres, causing even more displacement.

The region has an airport on the outskirts of Badajoz, where there are regular flights from/to Madrid and Barcelona, and other seasonal destinations. In regard to railway infrastructure, the regional government is working towards the development of a high-speed line, AVE (High Speed of Spain), which will link both Spanish and Portuguese capitals (Madrid-Lisbon) with stations in several cities in Extremadura.

## Population

Extremadura has a population of about 1.1 million people, with 688 777 inhabitants in the province of Badajoz and 413 633 inhabitants in the province of Cáceres, representing an average population density of about 26 inhabitants per km<sup>2</sup>. The regional capital, Merida, and the provincial capitals, Badajoz and Cáceres, along with Plasencia and the municipalities of Don Benito and Villanueva de la Serena are the other metropolitan areas in the region. The border town of Badajoz is the most populous, with more than 145 000 legal residents.

Extremadura's population consists of exactly 1 102 410 inhabitants,<sup>2</sup> representing 2.35% of the total population of Spain. The population density (26.47 inhab/km<sup>2</sup>) is very low compared to the National average (92.63 inhab/km<sup>2</sup>). The most densely populated province in Extremadura is Badajoz, with 688 777 inhabitants and a population density of 31 644 inhabitants per km<sup>2</sup> and a surface of 21 766 km<sup>2</sup> (Badajoz is the largest province of Spain). Cáceres, has 413 633 inhabitants living in an area of 20 819 km<sup>2</sup>, and is the second largest province of Spain.<sup>3</sup>

The most important urban centres are Badajoz (148 334 inhabitants), Cáceres (93 131 inhabitants), Merida (56 395 inhabitants) and Plasencia 41 148 inhabitants, according to the census of National Statistics Institute, 2009.

**Table 1. Cities in Extremadura more than 10 000 inhabitants**

Position	City	Inhabitants
1st	Badajoz	148 334
2nd	Cáceres	93 131
3rd	Mérida	56 395
4th	Plasencia	41 148
5th	Don Benito	35 791
6th	Almendralejo	33 588
7th	Villanueva de la Serena	25 838
8th	Navalmoral de la Mata	17 228
9th	Zafra	16 424
10th	Montijo	16 236
11th	Villafranca de los Barros	13 356
12th	Coria	12 896
13th	Olivenza	11 852
14th	Miajadas	10 338
15th	Jerez de los Caballeros	10 237
16th	Trujillo	9 860

The data in Table 2 presents the social indicators in 2009 with respect to the youngest population in the Autonomous Community of Extremadura. The table shows the annual rate of the last eight years and provides a comparison with the Spanish average.

**Table 2. Young people indicators\***

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Spain	98.54	96.44	94.92	93.82	92.76	91.73	90.84	90.46	90.44
Extremadura	101.16	99.09	96.93	94.99	93.14	91.33	89.67	88.29	87.05

\* Percentage of population under 20 years compared to 60 years and over.

Source: National Statistics Institute, 2010.

According to the census of the National Statistics Institute of January 2010, there are over 37 thousand foreigners in Extremadura. The figure concluded that 23 807 of them were living in the Province of Badajoz, and the remaining was living in Cáceres. The largest immigrant<sup>4</sup> community is from Morocco, followed by Romania and Portugal. Brazilian, Colombian, African and Asian immigrants (mainly from China) complete the demography.

Table 3. **Foreigners in Extremadura**

	Total	European countries	African countries	American countries	Asian and Oceanian countries	Unknown
Extremadura	27 870	12 635	6 476	7 596	1 163	N/A

Source: National Statistics Institute, 2007.

Since the 1960s, Extremadura's population has seen a rapid decline due to emigration to other countries and to more prosperous regions of Spain.

Currently, the Statistics of Resident Variations, made in July 2009 by the National Statistics Institute concerning 2008, shows the migratory balance of Extremadura in absolute values:

Table 4. **Migratory balance**

Migrations	Absolute values
Immigrations	30 584
Emigrations	27 397
<b>TOTAL</b>	<b>3 187</b>

According to the data collected by the National Statistics Institute, there were about 3 immigrants per 100 inhabitants in Extremadura in 2008.

## Economic facts

According to data from National Statistics Institute (INE) in 2009, Extremadura's GDP reached EUR 17 608 711 at market price. However, its' GDP represents 1.7% of the national GDP. This quantity had a rate of change of -2.4% in 2009, where the only areas which presented positive figures were in the energy and security services sector, amounting to 2.3% and 2.2%, respectively. The industry has been the component that has suffered more the consequences of the current crisis, dropping by 18% in 2009 compared to data from 2008.

In analysing the average annual growth rate of GDP between 2000 and 2009, it is estimated that the national average growth was of 2.32%, and that 10 autonomous communities exceeded or equalled that record, Extremadura however tops the list with a 2.79% average growth.

Extremadura's' economy is characterized by the importance of the service sector (63.4%) which has shifted, in recent decades. The weight of the primary sector has for centuries had in Extremadura, currently reaching 7.0%. This



means that, amongst other things, the specialization of farmers, the mechanization of fields, especially visible in the major irrigation in Alagón Guadiana, and by a buoyant tourism sector which has evolved dramatically, and which have risen, in recent years, a large number of farms in rural tourism.

One of the most interesting features of industry in Extremadura is the fact that, with over eight thousand companies in the region, only 1% has more than fifty workers. The main industrial sub-sectors are: energy, agro-industry, cork, textiles and ornamental stone. The construction industry represents a 14.0% to 5.4% of the total GDP in Extremadura, respectively, and finally, Extremadura get an energy industry that has been maintained at 3.1% in recent years.

## Employment facts

Table 5 highlights the key employment figures from the National Institute for Statistics (INE) for the first quarter of 2010, for people aged between 16 and 64.

**Table 5. Basic employment data for Extremadura**

Activity rate	The total active population in Extremadura is 483 700, which corresponds to a 68.32% activity rate, where the percentage of women in the workforce is 58.66% versus 77.56% for men.
Employment rates	The employment rate in Extremadura is 52.22%, from which 42.71% are women.
Unemployment rates	The unemployment rate is of 23.57%, exceeding the national figure of 20.05%. The percentage of unemployed women in Extremadura is of 27.19%, versus 20.95% for men.
Unemployment	There are 113 900 unemployed in Extremadura. Due to the expansion of the University of Extremadura and other training institutions, a large part of the Extremadura employed population seek positions according to their specific interests and training.
Self-employment	Currently, there are 81 500 workers belonging to the Special Scheme for Self-Employed in Extremadura, this represents 2.41% of the total national employment. Extremadura is currently launching several initiatives to encourage the creation of innovative business activities that have social interest (R&D, tourism, and child care are the main ones). Thus, this figure is expected to continue to rise in the region, to promote the work creation in vanguard areas of innovation and social.
Women activity rate	The percentage of women active in the region amounts to 58.66%.
Rural employment	Agriculture occupies 25.26% of the workforce
Urban employment	The services sector is leading the percentage distribution with 68.3% of the total. Industry and construction account for 10.5 and 11.4%, respectively.

There is no doubt that better educated people are more likely to enter the job market and occupy a place. However, in Extremadura there are some special features, according to data from the National Institute of Statistics (INE) 2009 that collects the data from the active population by level of training. The data states that 87.78% of workers trained in the area of science find jobs with little difficulty, followed closely by those who studied in the fields of arts and humanities with an 86.48%.

The unemployment rate, according to the training data, for workers trained in any area of the tertiary sector, was up to 29.36% in 2009. Workers who have some agricultural training are those with the lowest unemployment rates in the region (3.56%).

## Public institutions in Extremadura

Table 6 summarises some of the key national and regional policy drivers of green growth identified through the OECD study visit, which are already promoting the transition to a green economy in Spain in general, and in Extremadura in particular:

Table 6. **Institutions working in Green Economy**

Public Employment Observatory	It is a part of the regional government integrated unit assigned to the Extremadura Public Employment Service (SEXPE). Together with the Institute of Qualifications and Accreditations of Extremadura, it is a regional instrument of labour market analysis and of reference in strategic planning of active employment policies in the region, contributing to the development of professional qualifications and of occupational profiles related to the activities in the area of “green jobs”.
Extremadura Public Employment Service (SEXPE)	It is an autonomous organisation, of administrative character which is part of the regional government. The SEXPE is the managing organ of employment policies in the region.
Department of Equality and Employment	This Department, has more than 1 000 employees, and has produced a very relevant paper for the development of Green Economies in the Autonomous Community.
Department of Agriculture and Rural Development	Part of the regional government, it exercises the competitions that were attributed to the previous Councils of Rural Development, Agriculture and the Environment, except the ones relative to forest politics and the environment.
Regional Institute of Qualifications and Accreditations	The Plan II of Qualifications and Vocational training of Extremadura 2010-2013 refers to the trends of market analysis in the Social and Political Agreement of Reforms for Extremadura, in which it distinguishes itself from the green economy as one of the strategic sectors for the region. The modification of qualifications for professionals is necessary to take into account the needs for more employment.

Table 6. **Institutions working in Green Economy** (*continued*)

Network of Employment and Local Development Agencies	It is a local service provided to local administrations in collaboration with the SEXPE. It looks at the dynamisation of the territories, the promotion of employment and the support of managerial activity across the region.
Area of Equality and Local Development (Deputation of Badajoz)	The aim of this department is the balanced and sustainable development of the province, balancing its economic growth with social development and the preservation of the environment.
Autonomous Organisation for Local Development (Deputation of Caceres)	It is a service for the promotion of employment and development in the province of Caceres. It is oriented towards the promotion of employment and development to benefit people and supporting the town halls and the unions.
University of Extremadura. Business & Employment Office (BEO)	The BEO connects the university and the business world together to better train and inform university students on issues affecting the green economy.
The Rural Development Network of Extremadura (RDEDEX)	It unites 24 local action groups (LAGs), which manage the Community initiative LEADER and rural development programmes in Extremadura (PODER), and is currently in charge of implementing European strategies to rural development under the LEADER methodology developed through the Rural Development Programme of Extremadura EAFRD funds of 2007-2013.
Ministry of Economy, Trade and Innovation	Has among its principal purposes to encourage economic growth and businesses in the region, promoting activities to promote the internationalization of companies in the region of Extremadura.
Extremadura Energy Agency	The community programme for the promotion of energy efficiency of the European Union (SAVE the IIInd), promotes the creation of regional energy management agencies to help local authorities in the design of their energetic strategies resting on reporting and reaching all the consumers, to sensitize them on the existing problems giving an objective advice for the production and the follow-up of the energetic projects.
Extremadura Observatory of Climate change	Constituted of experts, scientists, technical specialists and qualified and experienced professionals in Climate Change. It is part of the Strategy of Defense against the Climate change of Extremadura which was approved in March, 2009 by the Meeting of Extremadura. One of its functions is to make a summary of information and regular production of reports that following the evolution of the effects of Climate Change.
Institute for the Sustainability of Resources (ISR)	Is a private Foundation, at an Iberian (and aiming to be supranational) level, consisting of one hundred patrons among which are counted in a balanced personalities and international experts, public, private and social agents. The foundation works in areas of sustainability the use of resources and the environment.

Table 6. **Institutions working in Green Economy** (*continued*)

Promotion of Nature and Environment	It is a public company belonging to the Public Management Company of Extremadura (GPEX) founded in March 2006.
Advice Adviser of Environment	The Law of June 26, 8/1998, on the Conservation of Nature and Natural Spaces of Extremadura in article 6 Adviser of Environment established the creation of the Advice Adviser of Environment as a collegiate organ for social participation, advice and cooperation, and for protection, conservation, restoration, improvement and the sustainable use of Extremadura's natural heritage.
Department of Industry, Energy and Environment	Part of the regional government, the Council of Industry, Energy and Environment, was created to promote competition in industrial arrangement, energy and mines.
Iberian Centre of Renewable Energies	Will be located in Badajoz, in the areas of the Logistic Platform, and be managed by a foundation. It will be ready in 2012
Extremadura Network of Protection and Investigation of Air Quality (REPICA)	It is a network which looks at air quality in the region. It was designed and managed by the Meeting of Extremadura (Council of Industry, Energy and Environment) and is in collaboration with the University of Extremadura.
Foundation for the Development of Science and Technology in Extremadura (FUNDECYT)	Created in 1995, its main objective is to stimulate the cooperation between companies, the University and public administrations in order to promote regional development. It is an initiative put in place in March 2010 with the support of the Regional Government, and the University of Extremadura.
Tourism Cluster in Extremadura	Encompasses 29 of the most representative companies of the tourism sector, proceeding from associations, hotels and companies of the region.
Energy Cluster of Extremadura	This is a managerial non-profit association, created in July 2008. Initiated by the second vice-president and economic adviser, trade and innovation of the Government of Extremadura, the mission of this group is to promote the integration, creation and strengthening of companies and institutions to insure competitiveness in the national and international arena. The Cluster has 75 members with 14 sub-clusters based on individual technologies. It represents the first group in the renewable energy sector.
The Scientific and Technological Park (STP) of Extremadura	The STP is a spin off settled in 2008, in joint cooperation with the University of Extremadura, whose aim is providing know how and training to ease the transition and transformation of companies in traditional sectors into low-carbon more competitive and innovative businesses.
ADENEX	An ecological NGO created in 1978 to provide advice to the regional government in topics related to science and natural protection.

*Source:* Ongallo (2010).

## Key initiatives for the green economy

### *Actions developed in the energy sector*

The aim is to reach a new energetic model that diminishes the pressures on the environment which is a key concept in the Extremadura environmental policy. In this respect, the Industrial and Energetic Planning and the Extremadura Energy Agency signed an agreement whose objective is the management and execution of concrete actions related to the *Strategy of Saving and Efficiency* 2004-2012 and the *Plan of Renewable Energies* 2005-2010 in Extremadura.

Extremadura has traditionally been a great exporter of energy. Now, the autonomous community is more aware of renewable energies. There has been a surge of requests for projects installation of these new energies lengthways and width of the region. At present,<sup>5</sup> the region is concerned with 430 projects in more or less advanced phases. Of all the requests for installation of offices for renewable energies there are more than 300 requests in Extremadura. Some of these projects focused on wind power, 16 on thermo-solar power, 11 on biomass and 7 focused on biofuels.

### *Project of Identification of Tourist Rural Products in Extremadura*

REDEX (the Extremadura Network for Rural Development) has recently presented a project examining rural tourism products. REDEX carried out this study with the participation of approximately 24 Extremadura local initiative groups. This project is part of a programme called the Spanish Tourism Horizon Plan 2020. This initiative aims to develop and generate quality rural tourism products, based on the identity and singularity of the different Extremadura destinations.

Thus, they will be able to offer tourists a series of experiences to discover and to enjoy the rural Extremadura. This programme has become very successful, with experiences ranging from the observation of the aquatic local fauna up to the possibility of experiencing the rural landscape by foot or bicycle. There are a total of 30 related experiences that will promote the tourism in the different regions.

### *Environmental Efficiency of Extremadura companies (EFIMEX)*

The project “Environmental Efficiency of Extremadura companies” EFIMEX was developed by FUNDECYT (Foundation for the development of Science and the Technology in Extremadura) with the co-financing of the Social European Fund. This project was created in the framework of the Green Jobs Programme of the Biodiversity Foundation, and the collaboration of the CETIEX (Technological Industrial Centre of Extremadura). Its aim is to

minimize environmental impact in favour of the sustainable development in food-processing companies in Extremadura and to contribute to the conservation and improvement of the environment through permanent training and awareness programmes for SMES in order to promote adapted practices in energy matters.

The project EFIMEX seeks to contribute to:

- The formation and training of executives and workers in SMES in order to update and improve their skills qualifications that make them more competitive.
- The sharing of all information on the managerial fabric in environmental suitable practices.
- The promotion of conservation and efficient use of energy and the promotion of renewable energies.
- The knowledge of the National Plan of R&D+i and of its environmental lines, in order to promote a highly competitive managerial structure.
- To promote the employment linked to New Employment Deposits of Renewable Energies, as well as the auto employment for the rural woman.

### *‘El Anillo’ – International Centre for Outdoor Sports*

Sport is a dynamic sector which is growing rapidly. Its macroeconomic impact is increasing and contributes to the aims of growth and creation of employment. It also serves as a local and regional development tool for, urban and rural regeneration.

Sports, has generated an added EUR 407 billion, that is to say, 3.7% of the GDP of the EU, and 5.4% of the workforce and employs 15 million people. Sports and leisure activity constitutes an important potential for tourism and is complement or alternative to the traditional tourism. The aims of “El Anillo” are:

- The normalization, regularization and professionalization of sports activity and of leisure sector.
- The modernization and development of the social and managerial fabric.
- To increase leisure activities of and free time in the natural way.
- The development of projects and innovative initiatives in the sector. To become a reference in innovative sports at an international level.

- The development of training plans, with special attention to disabilities and the inclusive leisure.
- To be a model for companies in the sector who are currently looking to collaborate in training and evaluation of management and to improve the quality of companies.

### *Iberian Centre for Renewable Energy and Energy Efficiency (CIEREE)*

The Portuguese Department of Hispanic Industry announced the creation of a joint workgroup for launching the Iberian Centre of Renewable Energies and Energy Efficiency in Badajoz. The workgroup will be part of the Andalusia conference, and will shape the needs of the CIEREE in concrete areas of work, with special reference to biomass and to energy efficiency, in the area of electrical vehicles before April 30, 2010. CIEREE's main objective will be the collaboration with the industrial sector. It will focus on project development in areas related to energy efficiency and renewable technologies.

## **General SWOT Analysis**

The following section draws from the previous analysis and from the Operative Programme of Extremadura co-funded by the ERDF (European Regional Development Fund) in 2007-2013. The ERDF study provides some of the most extensive documentation available on regional development.

Along with environmental conservation and the individual responsibility of every agent/participant in the system, there is a process of *reinvention* of the economic model of development that seems indiscriminate in its use of natural resources. These attitudes have led to the current environmental situation and to the urgent need to tackle this problem. It is for this reason that the incorporation of technologies is a key factor in future success.

Local and regional governments have started to value the importance of a green economy, not only as a way to fight climate change, but also as an area of economic development. For that reason it was decided to invest in the socioeconomic development of the region and taking advantage of the opportunities associated with the fight against the climate change. The production and consumption of biofuels, renewable energies and the establishment of new economic sectors in Extremadura are essential to a green economic development. The regional government has elaborated a Strategy as a framework to group and direct the actions for mitigation and adjustment of climate change between 2009 and 2012. The following SWOT analysis was done in preparation of such a Strategy. The following box presents the most relevant issues to the context of the OECD project.

### Overall SWOT analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Strategic location: proximity to Portugal and good neighbouring relations.</li> <li>• Important urban cultural and rural heritage, which, joined a landscape heritage of quality preserved well, is formed as one of the biggest wealth of the region.</li> <li>• Important tourist destination especially in new markets.</li> <li>• Clusters that agglutinate the main businesses and institutions in key economic sectors across the value. Philosophy of “co-ompetition or “cooperating to compete”.</li> <li>• Development of quality agricultural productions and capacity of productive diversification of the rural sector.</li> <li>• Good infrastructure with the Scientific and Technological Park of Extremadura</li> <li>• There is an improvement of the general level of education and training (36 % of the population with higher education in 2005)</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of infrastructure development, particularly in road building and general transportation.</li> <li>• Sparse population in a vast territory.</li> <li>• High dependence to fossil fuels.</li> <li>• Very little manufacturing and industry. Limited application of technologies in areas of traditional agriculture.</li> <li>• Productive fabric with a majority of very small companies with low efficiency.</li> <li>• The culture of research, development and innovation is not embedded sufficiently.</li> <li>• Insufficient levels of management. Poorly qualified people holding management positions.</li> <li>• Rates of activity, occupation and employment below the national average.</li> <li>• Aging population and high concentration of unemployment amongst women.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Water is abundant but is not exploited enough.</li> <li>• Opportunity to further develop the natural and cultural assets, across innovative activities in the tourism sector.</li> <li>• Favourable environment for the development of renewable energies both due to natural conditions and to political will.</li> <li>• Political and social consciousness on the conservation and improvement of heritage and the sustainability.</li> <li>• Favourable position for the development of relations with developing countries for historical, cultural and geographical reasons</li> <li>• Make better use of R&amp;D in the area of food processing, environment, and agriculture.</li> <li>• Availability of human capital locally (23.980 student in the University in Extremadura).</li> </ul>	<ul style="list-style-type: none"> <li>• Geographical location isolates the region. Extremadura has little weight in Spain and even less so in Europe. With the arrival of more countries to the European Union it continues to lose importance.</li> <li>• The world economic crisis is a threat to the survival of many companies.</li> <li>• More competitive tourism and innovative offered in other regions which compete directly with Extremadura in rural tourism and of interior.</li> <li>• Extremadura is experiencing brain drain, with people leaving the region to find work.</li> <li>• Lack of or very little mobility of workers in the region. This prevents certain adjustments on the labour market.</li> </ul>



## Notes

1. Ministry of Environment, Rural and Marine Affairs, May 2010.
2. National Statistics Institute, 2009
3. Data from the General Bureau of IGN (National Geographical Institute), Ministry of Development, January 2010
4. An “immigrant” is a person of the house who was born abroad, is more than 15 years old and lives in Spain (or intend to do so) for 1 year or longer. This excludes the case of a Spanish person who was born outside Spain in the year of the arrival to Spain they were less than two years.
5. According to the Managerial Association of Renewable Energies of Extremadura (AEREX).



## *Chapter 2*

### **Economic and labour market policy issues in Extremadura**

by Hyoung-Woo Chung

*Though well equipped with potential to develop, the region of Extremadura is experiencing serious population emigration and jobs crisis. Green growth can be a policy direction to create business and jobs opportunity in the region, while at the same time to sustain natural repository. To make the reform possible and elaborate a long term strategy which is supported by strong policy leadership, active partnership and rigorous entrepreneurship will be necessary.*

## Policy issues

While economic recovery seems to be underway, Spain is still faced with most difficult task of addressing high unemployment, while at the same time of finding new engines of growth. Meanwhile, compared to other OECD countries, Spain has been suffering from high external energy dependency and its production structure is very energy-intensive, heavily relied on fossil fuels (OECD Economic Survey of Spain, 2007). For this reason, Spain's greenhouse gas emissions in 2008 were 52% higher than 1990 levels, leaving it substantially short of its Kyoto objective for 2012 to limit the emission rise at 15% from 1990 level. Spain's CO<sub>2</sub> emissions increase between 1990 and 2008 was among the highest in the OECD (OECD Perspectives: Spain, 2010).

However, as agreed at the OECD Ministerial Council Meeting (MCM) in June 2009, the current crisis can rather act as a catalyst for much needed policy reform, generating both environmental, employment and economic gains. Green growth in this sense would be relevant going beyond the current recession, addressing urgent challenges including fight against climate change and environmental degradation, enhancement of energy security, and the creation of new growth engines (OECD, 2009).

Shifting to a green economy will be a major driver of structural change in labour markets. New skills and competences will be required, as well as enhanced labour mobility across occupations and sectors, posing new demands on education and training institutions, and labour market policies. In this sense, flexible labour market could be a way to reduce adjustment costs as it would promote a smooth transition to new environment. However, according to the OECD data (OECD, 2009), Spain's overall employment protection legislation<sup>1</sup> (EPL) restrictiveness indicator is the fourth highest in the OECD. Recent empirical research indicates that stringent EPL for regular contracts has a significant but small negative impact on long-run productivity (OECD, 2007). Also, strict EPL increases informal employment in countries with limited enforcement capacity (OECD, 2008).

One of the principal pillars of Spain's green growth strategy is renewable energy, which in 2008 accounted for 7.3% of primary energy supply. The goal is to increase this percentage to 20% by 2020. This is backed by a study which suggests that renewable energy and energy efficiency definitely have a key role for environmental sustainability as well as for economic development (GHK, 2009).

It is however clear that the transition to green growth will require carefully targeted policy direction and strong leadership to systematically organise various efforts and resources (Headwaters Economics, 2010). Designing an integrated strategy for managing and enabling green growth requires taking into account a multiplicity of policy fields and target groups.

Also, successful experiences from OECD countries have shown that re-skilling of the workforce, while keeping up productivity levels in the greener economy and expanding to new economic activities, require the public sector adopt a multi-stakeholder approach, working in partnerships with unions, the business sector, the education sector, and other local institutions (ETUC 2006; OECD 2010).

Extremadura is the community where the land territory is huge, natural resources are abundant. On the contrary, population in the region are continuously shrinking<sup>2</sup> and ageing, job opportunities are contracting. As a result, the region represents only 1.7 % of total national GDP. Therefore, the most relevant policy issues in Extremadura would be how to successfully carry out dual mission of achieving economic development while sustaining its natural repository as much as possible. Green growth in this sense should be a solid policy direction for the region of Extremadura.

## Analysis of Extremadura

### *Economic and labour market condition*

Extremadura is the fifth largest region with a very low population density (26.47 inhabitants per km<sup>2</sup>). The region has 167 natural protected areas, which accounts for one-third of the region. However, this is the region where youth people have continuously been decreasing (87.05<sup>3</sup> in 2008), which is faster than entire nation (90.44 in 2008) and maybe reflecting less jobs opportunity in the region. The government of Extremadura is yet to promote businesses creation and to induce larger companies to attract the talented workers, to offer enough jobs in the region. Extremadura as a result shares much smaller portion among the national GDP than that of its population which represents 2.35% among total Spain.

Turning to labour market data (see Table 7), employment rate in Extremadura was 41.05% in 2009, while the rate for entire nation amounts to 60.6% (OECD weighted average in 2009 was 64.8%; OECD Employment Outlook, 2010). Lack

**Table 7. Comparative labour market data in 2009**

	Employment/population ratio	Labour force participation rate	Unemployment rate
Extremadura	41.05	53.62	23.57
Spain	60.6	74.0	18.1
OECD (weighted average)	64.8	70.7	8.3

*Source:* OECD Employment Outlook (2010); Diagnostic Report Extremadura, OECD (2010).

of jobs in the region<sup>4</sup> and/or problematic nation-wide informal economy<sup>5</sup> might explain this particularly low employment rate. More serious issue in the region would be its unemployment rate which soared up to 23.57% in 2009, compared to national rate at 18.1%. Meanwhile, wage level in Extremadura is 30-40% less than national average and this could be both advantage and disadvantage for the region. Low wage may be an allure to the business, however, how can Extremadura successfully induce skilled workers into the region?

### *Active labour market policy and public employment service*

Job placement function or public employment service (PES) in Spain was decentralized to the regions between 1998 and 2002. This means that unemployment insurance benefits are nationally financed, but regional governments such as Extremadura manage placement services and many of the active labour market policies (ALMPs<sup>6</sup>). However, this can create a free-rider problem as witnessed in Belgium and Canada where employment services are also delegated to the local governments. In other words, a possible failure to implement employment measures by the regional authority would worsen regional unemployment problem, nonetheless, its costs (in terms of benefit payments and the financing of some ALMPs) are borne by the central government. Therefore, the problem in this system is that when a region is successful to provide the unemployed with jobs, then it would receive less central funding. Moreover, a rigorous implementation of mutual obligation principle that deprive the unemployed of benefits rights when they do not comply with job search requirements would result in receiving less central government transfers. There is also a risk, as shown in other decentralized countries such as Canada and Switzerland, that ALMPs are not designed to enhance employability but rather to place customers in short-term jobs that put them back to the situation in need of unemployment benefits paid by the central government.

From 2000 to 2008, Spain's unemployment according to the national labour force survey fell by 5%, but the number of unemployment benefit recipients increased 66%. Given the current context of a larger pool of job-seekers as well as a weaker labour demand, PES in Extremadura is facing another difficult test. On the supply side, PES is responsible for training and retraining the unemployed, and assist in matching candidates to job vacancies through the networking built around the organisation. On the demand side, PES's function involves employment subsidies to employers or even direct employment creation. All in all, the basic policy issue of the PES in the region is to reduce the number of people in open/passive unemployment.<sup>7</sup> However, the unemployment data in Extremadura shows that PES has not been so successful in fulfilling its mission, though the PES itself may have created some jobs.

### *Scattered system*

Since June 2010, the Spanish government has relaxed its EPL system as an essential part of its labour market reform package designed to help shake up Spain's sluggish economy. The reform has cut severance payment that formerly amounted 45 days pay for each year worked for workers on full-time staff contracts to 33 days and has been finally endorsed by the Parliament [Congreso de los Diputados] in September 2010.

The strong decentralization rally of public spending has limited the central government's expenditure to be only around 8% of GDP. Regional governments have an important and practical role to make green growth and jobs possible (OECD Economic Survey, 2008). For example, about half million government jobs have been created since 2000, mostly by regional authorities, while employment in central government has fallen slightly (OECD Economic Survey, 2007). In Extremadura, it seems that there exists a lot of regulation, resources and actors in terms of basic necessities to proceed with green growth. However, what really matters would be streamlined and interlinked efforts backed by strong leadership to reach the policy goal. In this sense, current economic and labour market data shows that the government of Extremadura can do more in terms of improving the governance and lead by example. Also, as suggested in OECD Economic Survey (2007), evaluation activities of the government programmes have not been substantially implemented in Spain. For instance, rigorous evaluation work of activation programmes initiated by scholars or private institutions are extremely rare (European Commission, 2006).

### *Leadership and Networking*

In this globalized and opened world, networking could be a critical factor which determines success or failure of government policies. The sustainable green growth programme is composed of complex contents and processes in nature, which embrace many government activities (*e.g.* public finance, labour market policies, trade policies, agricultural, industrial and innovation policies). Therefore, multilevel governance is required and it should involve all the actors from individual citizens to public authorities. In Extremadura, it seems that there are way too many green regulations, programmes, institutions and actors. However, there is no umbrella plan which could put resources, personnel, and efforts existing in Extremadura together. In other words, the region is yet to make coordinated efforts and rigorous monitoring to make green growth possible. For example, most talented human resources are supplied by the one and only University of Extremadura. However, some suggest that the university does not understand much about enterprises needs, and that collaborations between the university, regional government and the business are rare.

In terms of employment bodies, in Extremadura there are 41 public employment centres in 8 territorial zones under the authority of the Regional Ministry of Equality and Employment, and 210 Employment and Local Development Agencies (80% of budget from the Extremadura Public Employment Service and 20% from city council). The Observatory of Employment also carries out analysis/studies on active labour market policies under the direction of SEXPE. Other government bodies such as the Regional Ministry of Agriculture and Rural Development and the Regional Institute of the Qualifications and Accreditations are in part responsible for employment in Extremadura. However, it would be important to assess whether they are effective in organizing physical and human resources with a determined policy leadership; in doing the major players properly equipped with knowledge and awareness to make green growth happen in the region; in investing in research and development in this field or in securing enabling infrastructure, such as rail and road, etc.

## Challenges and opportunities

### *Strengths*

*Well preserved vast land which treasures significant natural and cultural heritage*

This enables the region to provide tourists attraction as well as to yield a lot of agricultural and forestry products. This is a very strong portfolio for the region, thereby should be an important consideration when dealing with green growth agenda. As witnessed in other countries and regions, renewable energies such as wind and photovoltaic power would also contribute to promote economic and jobs growth, while at the same time to conserve natural resources. The renewable energy agenda is an important one in Extremadura, but other sectors of potential development and job creation in the green economy should be taken into more serious consideration as well. For example, eco-tourism and leisure activities have potential to grow and in turn to create jobs. Also according to relevant data, there are not so much of carbon-emitting industries in Extremadura, and the region is committed to develop clean energy sources.

*Presence of organisations to push forward the green growth agenda*

In Extremadura, there are ten institutions active in the field of employment and local development and twelve bodies that are in charge of climate change. The presence of these organisations and manpower are favourable conditions for any government to serve the people better. However, the key issue in Extremadura is how the regional government utilizes its institutional resources as systematically and efficiently as possible.



## ***Weaknesses***

### *In need of active green entrepreneurship*

Small and medium-sized enterprises (SMEs) may have advantages in flexibly adapting themselves to a changing environment. However, at least in terms of developing green initiatives, the SMEs do not seem to have been very adaptive, nor been active in collaboration works related to green innovative activities so far. This does not mean that big companies have been particularly keen to promote green business in the region either. Also, despite abundant green regulations, programmes and budget, it is sceptical in practical terms, for example, whether the business sector or the government have brought up or recruited human resources who are equipped with the adequate skills, and thereby are able to manage or push ahead a green growth strategy. Meanwhile, SMEs are in lack of resources to invest especially at the earlier stage of green growth initiatives. Yet, as we have discussed, the presence of big companies that can make serious investments in the region is significantly limited. All in all, the policy environment in Extremadura requires the government to take initiatives in investing to and/or supporting green sectors to create business opportunities to reach a critical mass of enterprises in the region.

### *Lack of policy leadership/networking that coordinate and systematize efforts to green transition*

Despite the presence of many public and private bodies responsible for green growth, the green activities, especially in green employment area, do not seem to be very effective or well organized. Given that green service (including eco-tourism) and energy (such as wind and solar) sector will be the main drivers for future growth in the region, the government of Extremadura has yet to make great effort to reach a supportive policy framework. The functioning of the system in Extremadura lacks of determined policy leadership and of collaboration between actors. However small, this could be a serious flaw which impedes smooth and successful transition to a greener economy.

## ***Opportunities***

### *Strategic location and cooperation with Portugal*

Most of all, the cooperation project with Portuguese authority to create the first international natural park (Tajo-Tejo) will be a great opportunity for the region to develop further. This tri-lateral (Extremadura government-Spanish government-Portuguese government) project can attract serious investment,

promote research collaborations, and attract international tourists. Significant challenges though would be how to effectively promote the project, while at the same time to move forward in the direction of contributing to regional economy as well as employment.

### *The potential to advance international market*

Given that organics are deserved well of people nowadays, there is a good chance for the region to increase its market share of eco-products, such as organic foods, in and out of Spain. The region also has 19 export consortiums to support promotion and marketing activities in this field. Creating a flagship which represents Extremadura would be a necessary step to trumpet the region's excellence. At the same time, more aggressive public relations and maximum high-quality strategy would help to materialize the green potential in the region.

### *Threats*

#### *Decreasing population and low employment rate*

The population of Extremadura is shrinking since the 1960s, while at the same time is ageing. This tends to reduce market volume in the region, which is very much related with drop in sales and profits of companies, and in turn decrease employment opportunities. The Extremadura low employment rate (41.05%) clearly reflects this problem. On the one hand, population ageing is also posing a serious threat to the region. Ageing would place substantial pressures on public finances in terms of pension and health insurance expenditures and other social spending, subsequently reduce growth potential<sup>8</sup> and living standards. In this respect, raising total employment rate,<sup>9</sup> including elderly and female rate, should be a priority policy goal for the government.

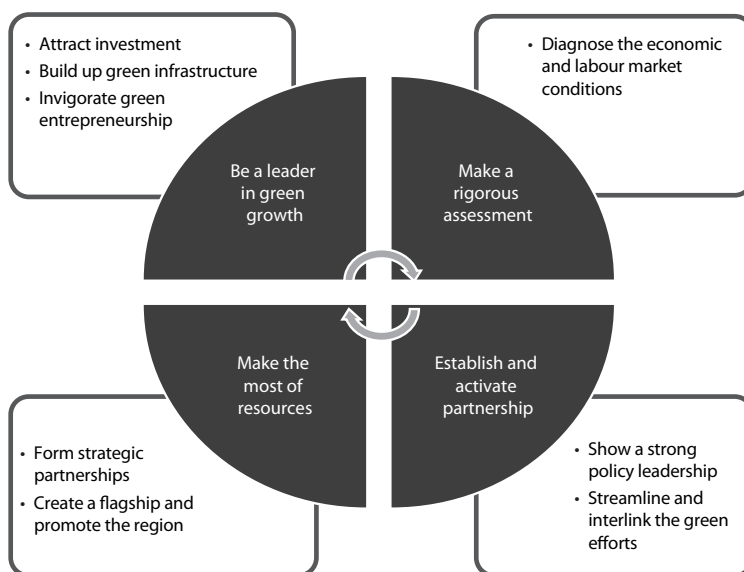
#### *Global recession and subsequent central government's budget cut*

Spain has been one of the most adversely affected countries by the current economic downturn. The national unemployment rate has reached almost 20%. In late September, the Spanish government announced its 2011 budget that will increase income tax for the rich and cut ministerial expenditure by an extraordinarily large 16%. The reduced spending power from the central government might allow the Extremadura government much less room to invest in new growth engines.

## Recommendations

Four overarching policy recommendations (see Figure 1) seem to be relevant to the government of Extremadura, based on the findings and policy issues mentioned above. Detailed recommendations are presented below within the framework of the recommendations. Some recommendations can be complementary to existing strategies and ongoing works by the regional government.

Figure 1. Framework of policy recommendation



### *Make a rigorous assessment of policy environment*

#### *Diagnose the economic and labour market conditions in the region*

In order to enable the success of green growth initiatives, Extremadura is first advised to make a comprehensive assessment of its economic and labour market conditions.<sup>10</sup> Study results suggest that the most effective green growth initiatives tend to reflect specific conditions of the given country or region. In this sense, the following guidelines should be considered (Global Advantage Consulting, 2009):

- First, in order to meet particular green growth goals, it is necessary to determine and fill in the gap between existing and required skills, be it managerial, technical and/or trade skills in various sectors.

- Second, labour market needs is an important factor to consider. As there are so many problems in the labour market (low employment, high unemployment, lack of talented youth, etc.), the Extremadura government may need to prioritise the policy issues to be addressed. Although the policy objective does not include aids to enhance labour market outcomes for specific groups (e.g. marginal groups), there is a need for an elaborate policy tool to analyse and reflect upon their particular needs, capacities, and aspirations.
- Third, if the green growth initiatives are to be successful, the region should first examine existing industrial assets and resources, including technologies, R&D capacities, collaboration with educational and research institutions, etc. In this sense, industry capacity and infrastructure is also an important factor to take into account.
- Finally, it is recommended that the region closely examines business needs. Companies are sources of innovation and job creation, so the government should first identify their needs by a broad consultation process and reflect the results in related programmes as much as possible.

### ***Establish and activate partnership***

#### *Show a strong policy leadership*

As has been witnessed in the best practices among OECD countries, targeted public policy and strong support for businesses under determined leadership are the keys to success. Strong policy leadership is a dedicated effort which provides all the actors with confidence, resources, and support. In Extremadura, more organized efforts would bear fruits. A consistent policy direction and leadership will be a much needed virtue to support the transition to a green economy. A practical approach would be to first make certain that mid- and high-level managers in the public sector are well prepared in terms of knowledge and resolution to transform the sluggish economy into a greener and more vibrant one.

Turning to employment issues, the most effective policy tool to implement labour market programmes is the Extremadura Public Employment Service (SEXPE), whose role will be even more significant in the transition to a greener economy. The SEXPE in this sense is the centre of excellence in the collection of information on the regional business environment, the corporate restructuring, the job transfer, the job opening opportunities, the identification of skills needs and the share of information among the civil society. For unemployed, SEXPE is a body which functions include the management of professional profiles with regular interviews, management of individual cases and skills audits, developing active employment policies in the labour market.

*Streamline and interlink green efforts*

Enhancing public awareness of green growth is needed in Extremadura. In addition, the policy exercises reviewed in OECD countries imply that the most powerful driving force for the territorial policy initiatives comes from multi-sector partnerships. Also, effective regional and local level policy tends to reflect the actual needs of the local actors. This bottom-up approach<sup>11</sup> has become more and more common since the beginning of the 1990s (OECD, 2004), and is also a good example for the region of Extremadura to follow.

*Make the most of resources**Form strategic partnerships with other countries or regions*

If green growth is a way to achieve sustainable growth for Extremadura, then preserving nature as much as possible and utilizing it by environmentally friendly methods should be encouraged. Clearly the region enjoys competitive edge in natural heritage and clean energy resources. Successful stories in other nations and regions illustrate that collaboration works between regions or states have resulted in much value-added outcomes in terms of economy as well as employment. In this sense, the “Tajo-Tejo” project will be a touchstone in promoting green growth and jobs in the region.

*Create a flagship and promote the region*

Creating a flagship which well represents Extremadura’s virtue will be a meaningful step for the region. At the same time, though several products from the region have already entered the international market, a head north strategy will add value to the efforts. Also, a quality-up strategy for the products should be considered – perhaps through the creation of a quality label including a sustainability (or green) component. This quality label should need to set the standards for products to obtain this label. But such a label should be regional wide and strongly supported regionally, nationally and internationally by the Extremadura authorities. There is a big potential to place Extremadura as a reference in the green or sustainable market.

*Be a leader in green growth**Attract investments*

Attracting investments will be an effective way to address current economic and labour market slack. Because renewable energy sector involves very high start-up costs, the industry will locate in those regions that provide the best incentives and labour force. At least this is a region in which land and

natural resources are abundant. As suggested in Five Rocky Mountain States experiences (see annex), capturing large-scale investment is one of the keys to success (Headwaters Economics, 2010), and this is a field where determined minds prevail.

### *Build up green infrastructure*<sup>12</sup>

Reinforcing green infrastructure will promote the region's transition to a green economy. This includes: promoting R&D activities in collaboration with the business, research and education institutes; providing clean-tech incubator for emerging companies; expanding road, railway, etc. network; establishing green development fund; supporting commercialization of new green technologies (including encouraging university professors to start-up green business); making best practices available; adopting new building codes and methods, etc. These green infrastructure systems will help protect naturally functioning ecosystem while at the same time provide a framework for sustainable development (Sprawl Watch Clearinghouse, 2002). Again, effective networking will be a key to success in building green infrastructure in the region.

### *Invigorate green entrepreneurship*

OECD suggests (OECD Perspectives: Spain, 2010) that entrepreneurship is an important driver of innovation and this would promote creation and/or improvement of green products, services and processes. It is no doubt that well oriented and consistent policy support as well as a proper regulatory framework and a skilled workforce will boost entrepreneurship. In this sense, more efforts are needed to create a culture of entrepreneurship and innovation in this region to foster business activities based on close collaboration with social partners such as University of Extremadura. One way to boost entrepreneurship in the region would be initiating public procurement of green products, which can help create market demand and rooms for innovation, especially in emerging sector like green economy. The green public procurement opportunities are further developed in Chapter 5.

## Notes

1. Employment protection legislation refers to the set of rules governing the hiring and firing of employees.
2. Population in Extremadura represents 2.35% of total in Spain (National Statistics Office, 2009)
3. Percentage of population less than 20 years compared to 60 years and more.
4. Among more than 8 000 companies active in the region, only 1% of them are with 50 or more employees.
5. For example, the Economist (April 8, 2010) reports that the Spanish tax inspectors' union, Gestha, believes that underground economy in Spain accounts for more than 23% of GDP and that it grew by 0.7% last year when recorded GDP shrank by 3.1%. The informal economy is especially attractive to those still receiving unemployment benefits based on previous earnings. They are often reluctant to go back into formal work until the two-year payment period is over.
6. The OECD (2000) has set out seven distinct objectives of active labour market policies (ALMPs): 1. Job creation, either to reduce the number of registered unemployed in the short-run or to generate jobs persisting beyond the period of intervention, such as jobs in the social economy; 2. Job redistribution, to re-order for equity reasons the job-seekers' ranks and to give the long-term employed a chance to enter into jobs which would otherwise be offered to others, and thereby maintain an attachment to the labour market for groups at risk; 3. Skill and human capital acquisition, which may not lead to a job immediately but enhances the employability and productivity of the unemployed, whose skills are otherwise eroded by long spells of inactivity; 4. Attitudinal change, combating the discouragement and alienation of job seekers, enhancing their motivation and willingness to work; but also encouraging employers to recruit and overcome prejudices and stigmatization; 5. Increase of earnings, either in the long- or short-run; combating poverty and unemployment traps, particularly in low wage and low skill segments of the labour market; 6. Increasing the potential labour supply, or reducing structural unemployment without increasing wage push inflation; 7. Addressing wider social objectives, such as promoting health, combating criminality and enhancing the social cohesiveness of communities.
7. Another issue in relation to PES function in Spain is few ALMPs covering the unemployed are evaluated on a regular basis (OECD, 2007g), while at the same time rigorous evaluation studies of activation programmes done by researchers and other private institutions are scarce (European Commission, 2006). Such evaluations have been carried out in Australia, France, Switzerland and the United Kingdom, and are used to improve the design of ALMP measures.
8. For instance, on the basis of unchanged participation patterns and productivity growth, the growth of GDP per capita in the OECD area would decline to around

1.7 % per year over the next three decades, about 30% less than its rate between 1970 and 2000.

9. The Lisbon strategy (2000) featured by its total employment rate of 70% goal put great emphasis on labour market reform to promote structural adjustment to address challenges posed by globalization, knowledge economy, population ageing, and the shift to a greener economy (S. Theodoropoulou, 2010). Now, EU 2020 strategy has replaced the employment goal with newly set at 75%.
10. OECD (2010) also suggests that there are several policy tools to reach green growth policy goal: the first approach is price-based (or market-based) instruments (taxes, fees or charges as well as tradable permits or quota systems); the second is regulatory instruments (all forms of regulatory approaches that impose choices on business operations, technology standards, outright bans); the third is green technology and innovation support instruments (directed R&D funding, public procurement, green certificates, feed-in tariffs); and lastly, voluntary and information-based approach (rating and eco-labelling programmes, voluntary agreements).
11. To guide the identification of suitable examples of bottom-up approaches for the analysis, the OECD (2004) has proposed a specific working definition of bottom-up approaches. That is:
  - A process through which a certain number of local stakeholders mobilise themselves in a given territory in order to initiate activities using, if possible, the territory's resources.
  - An attempt to involve and empower those people affected by the problems in the development and implementation of the solutions.
  - The initiatives must spring from the local level and not be imposed by a higher authority.
  - The mobilisation of a coalition of interest and the commitment of a range of key actors within a territory.
  - A greater participation in the decision-making and actions of local stakeholders which have often been ignored by past policies.
  - A formal organisational structure for project development and implementation.
  - A common agenda and action plan.
  - An approach to cover a broad range of employment, social and environmental issues.
12. Green infrastructure would be the ecological framework needed for environmental, social and economic sustainability. Green infrastructure differs from conventional approaches to open space planning because it looks at conservation values and actions in concert with land development, growth management and built infrastructure planning (Sprawl Watch Clearinghouse).



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## *Chapter 3*

### **Greening jobs in Extremadura**

by Richard Howard

*This chapter focuses on the potential to create new “green jobs” and to “green” the existing jobs in Extremadura. This has been achieved through consideration and analysis of the following issues: labour market functioning in Extremadura; changes to economic activities as a result of climate change (direct impacts and through effects on policy and regulation); changes to labour markets as a result of climate change; and potential policy actions to support the transition to a green economy in Extremadura.*

*This chapter starts by outlining a definition of the “green economy” and “green jobs”, and ways in which the sustainability and climate change agenda can impact on the labour market. This is followed by a baseline analysis of the number of green jobs in Extremadura and Spain, based on existing research. This is followed by analysis of trends in a number of sectors, considering the extent to which the above labour market impacts of the growth in the green economy are already taking place, and the potential for further change. It concludes with a set of policy recommendations on how to green the labour market in Extremadura and promote job creation in the low carbon economy.*

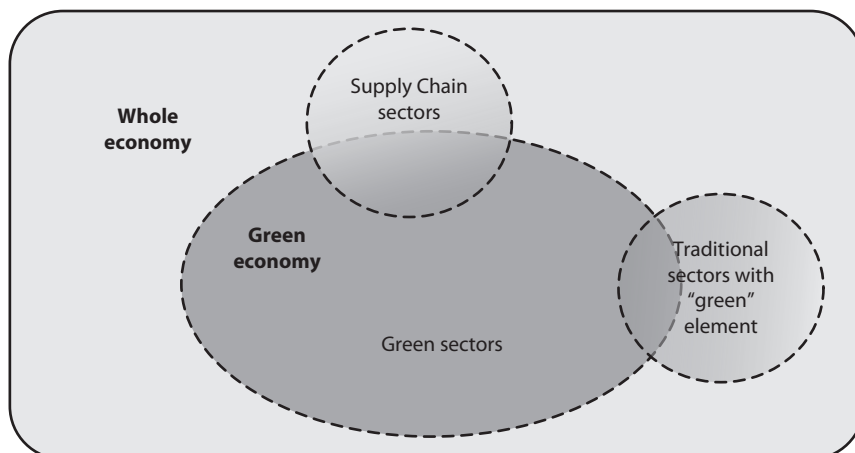
## Policy issues

The “green economy” is one of a number of terms used to describe industrial activities and sectors related to the environment – alternative terms include “Eco-industries” or “Environmental Goods and Services”. There is no universal definition of the green economy. For the OECD, green growth implies decoupling economic and environmental performances, as well as making investment in the environment a driver of economic growth. Among OECD countries, green growth is gaining support as a way to pursue economic growth and development, while preventing environmental degradation, biodiversity loss and unsustainable natural resource use. It builds on existing sustainable development initiatives in many countries and aims at identifying cleaner sources of growth, including seizing the opportunities to develop new green industries, jobs and technologies, while also managing the structural changes associated with the transition to a greener economy (OECD, 2010).

UNEP (2008) suggests that the label “green” is often used to describe a *relative* distinction between green products and services and alternatives. Therefore, this label is highly dynamic and can change over time as more products and production processes are greened.

Through previous work on the green economy (for example, DTZ 2009) a conceptual distinction has been drawn between entire industrial sectors which are focused on green activities (for example renewable energy or waste management); a green element of a traditional sector (for example the production of energy efficient lighting as opposed to standard lighting or the

Figure 2. **Components of the Green Economy**



Source: DTZ, 2009.

production of organic as opposed to conventional foods); and the supply chain sectors which support the above activities. This is illustrated in Figure 2.

Within both “green” and traditional sectors, there are a number of ways in which economic activities may be considered to be “green”:

- **Green products** – new green products or greener versions of existing products, for example an energy efficient washing machine as opposed to a standard model.
- **Green production methods** – reducing the environmental impact of products through improvements in design and production methods, and reductions in the use of energy and materials.
- **Green operations** – reducing the impact of businesses and sectors through greater environmental management.
- **Green supply chains** – this could include both upstream effects (e.g. supplying to green sectors as opposed to other sectors) and downstream effects (e.g. reducing indirect environmental impacts through sustainable procurement).

Based on the above working definition of a green economy, *how then can we define green jobs?* A number of studies (in particular UNEP, ILO, IOE, ITUC, 2008; Apollo-Alliance, 2008; Martinez-Fernandez et al, 2010; EC DG Environment, 2008) broadly define green jobs as any job which contributes to the transition to a green economy; or more specifically to protecting the environment, reducing the harmful effects of human activity, or adaptation to climate change. The same studies have identified a number of ways in which employment in the economy will be affected by climate change and environmental policy:

1. **Job creation** in green sectors – for example the growth in the renewable energy sector due to government subsidies for green energy.
2. **Job substitution** within traditional sectors – for example shifting jobs from the production of petrol engines to electric and hybrid cars.
3. **Job transformation** – changes to existing job profiles to include green activities, for example the shift from standard to ecological construction methods.
4. **Job elimination or relocation (“carbon leakage”)** – the elimination or relocation of jobs or economic activities due to environmental legislation. This could include for example, the loss of jobs from a cement factory due to the introduction of more stringent environmental standards or carbon pricing. In some cases the jobs may be lost altogether; whilst in other cases the jobs may be relocated to

a country with lower environmental standards. The later of these trends has been described as “carbon leakage”.

The US Centre for O\*NET Development (Dierdorff et al, 2009) has put forward an alternative taxonomy of impacts of the growth in the green economy on occupational requirements, as follows:

- **Green Increased Demand Occupations** – green economy activities lead to an increase in demand without significant changes in worker requirements. An example of an occupation in this category is insulation workers.
- **Green Enhanced Skills Occupations** – green economy activities lead to a significant change in the worker requirements of an existing occupation. An example is an Environmental Engineer.
- **Green New and Emerging Occupations** – green economy activities creates the need for new work and worker requirements – for example energy auditors and solar PV installers.

All the above highlights the importance of discussing and adopting a working definition of the green economy and green jobs, and provides a basis for the purposes of this review.

## **Analysis of Extremadura**

The stakeholders interviewed as part of the review in Extremadura had mixed views on the definition of the green economy and green jobs. Some took a fairly narrow definition, focusing on activities such as renewable energy, environmental protection and nature conservation; whilst others had a much broader definition even including activities such as green ICT. It is clear that the regional government of Extremadura does not have a view on the definition, nature and scope of the green economy in the region. Indeed, the interviewees from the Directorate for Training for Employment identified that there is a Spanish national catalogue of job profiles which contains 200-300 individual roles. The regional directorate are considering the impact of the greening of the economy on the role profiles, but to date have only considered job creation within green sectors; not the wider impacts on job transformation.

### ***“Green jobs” in Extremadura***

A number of studies have already been carried out to estimate the number of “green jobs”<sup>1</sup> in Spain and its regions, the most comprehensive being the national “Green Jobs” strategy (“Empleo Verde en una Economía Sostenible”, Biodiversity Foundation, 2010). The sectors and activities

included within the definition of “green jobs” within this study includes both entirely green sectors (*e.g.* waste management), and green elements of traditional sectors (*e.g.* environmental employment within industry, and within the public sector), but appears not to include jobs associated with eco-building, eco-tourism or green industry supply chains; which could all be significant both in Extremadura and Spain as a whole.

As shown in Table 8, a total of **10 419 green jobs** have been identified within Extremadura – this constitutes 2.5% of all jobs within the region. This is in line with the national picture where green jobs constitute 2.6% of all jobs (530 000 green jobs in total) – hence the overall level of specialisation in green sectors is roughly equivalent in Extremadura to Spain as a whole.

The key activities in Extremadura in terms of the absolute number of green jobs are **eco-agriculture, renewable energy, waste management, and**

Table 8. Estimates of the number of green jobs

Activity	Extremadura	% of all green jobs	Spain	% of all green jobs	Extremadura as % Spain	Location Quotient
Eco-agriculture & farming	3 063	29%	49 867	9%	6.1%	3.1
Renewable energy	2 088	20%	109 368	21%	1.9%	1.0
Waste management	1 676	16%	140 343	26%	1.2%	0.6
Forest management	778	7%	32 400	6%	2.4%	1.2
Water treatment/purifying	712	7%	58 264	11%	1.2%	0.6
Management of natural spaces/environment	667	6%	10 935	2%	6.1%	3.1
Public sector – environmental administration	430	4%	53 072	10%	0.8%	0.4
Environmental education	296	3%	7 871	1%	3.8%	1.9
Environmental services for companies	284	3%	26 354	5%	1.1%	0.6
Environmental employment within industry and services	222	2%	20 004	4%	1.1%	0.6
Environmental Research & Development & Innovation	203	2%	21 929	4%	0.9%	0.5
Total number of green jobs	10 419		530 407		2.0%	
Total jobs (all sectors)	409 000		20 257 000		2.0%	
Green jobs as a proportion of all jobs	2.5%		2.6%			

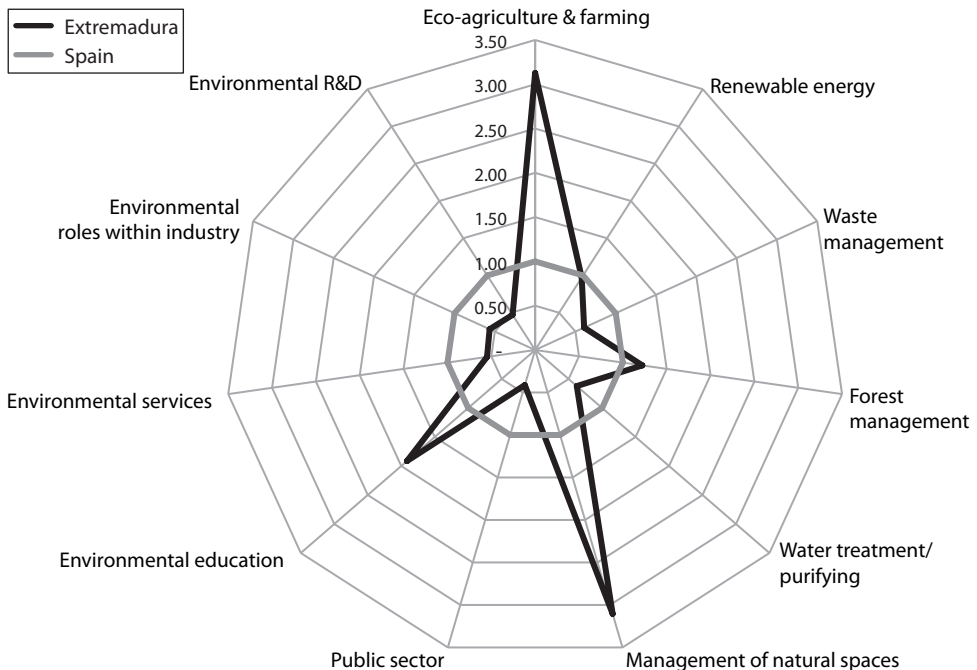
Source: Empleo Verde en una Economía Sostenible and DTZ analysis.

**forest management** – collectively accounting for nearly three-quarters of all green jobs in the region (7 600).

When compared to the figures for Spain as a whole, it is clear that Extremadura has a strong concentration of jobs in some but not all green sub-sectors. Figure 3 provides a Location Quotient for green sectors – which shows the concentration of employment relative to the national picture.<sup>2</sup> There is a concentration of employees in **Eco-agriculture and Management of Natural Spaces** – both of which have a concentration of employment three times higher than the national profile. This reflects the economic structure of Extremadura as a whole (*i.e.* with a focus on primary industries); and the significant natural resources and conservation areas within the region. Extremadura also has a concentration of employees in **Environmental Education** (Location Quotient of 1.9), and **Forest Management** (LQ of 1.2). The Agriculture and Forestry sectors are explored further below.

Interestingly, whilst the renewable energy sector shows significant potential in Extremadura (see further discussion below), the Extremadura position at present is typical of Spain as a whole, with renewable energy representing around 20% of all green jobs.

Figure 3. Green Economy specialisms in Extremadura



Source: DTZ analysis of data from “Empleo Verde en una Economía Sostenible”.



Whilst waste management is the most significant activity at national level (140 000 employees, or 26% of all green jobs), there are relatively few employees within this sector in Extremadura (16% of all green jobs, or a Location Quotient of 0.6), which potentially points to further opportunities in this sector in the region. Trends and opportunities in the Waste Management sector are explored further below.

Similarly, Extremadura has relatively few green jobs in the public sector compared to the national breakdown. This may in part be due to the fact that there is a concentration of green public sector jobs in Madrid – including some national functions. However the relatively low proportion of green public sector jobs in Extremadura is an indication of the relatively “light-touch” approach of the Extremadura public sector in environmental administration and enforcement.

Extremadura also has very few jobs in Environmental R&D (Location Quotient of 0.5). This issue was highlighted through the study visit, as it was clear that the university offer was not sufficiently aligned to the green economy, and had not been tailored to potential green growth sectors.

It is worth considering that there has been a significant growth in the number of green jobs in Spain in recent years. The Biodiversity Foundation study estimates that the number of green jobs has grown from around 160 000 in 1998 to the current 2009 figure of 530 000 (an increase of +235%). However, there is evidence of a number of potential barriers and challenges within Extremadura and Spain as a whole to the further expansion of the green economy and green jobs, namely:

- **Low investment in (environmental) R&D** – The low level of R&D spending in Spain is a significant weakness in the Spanish innovation system. R&D expenditure accounted for only 1.35% of Spanish GDP in 2008; compared to a EU27 average of 1.81%, and an OECD average of 2.33%. This is holding back the development of new high value products and services; including green products and services.
- **Current economic crisis** – There was a reduction in GDP in Extremadura of 2.4% in 2009 (Source: diagnostic report). This drop in economic output will divert attention and investment away from green sectors and green issues – as has been experienced in other EU regions facing recession. The experience in the UK has been that the recession has caused a temporary sharp reduction in carbon emissions (as emission are strongly linked to economic activity); however the recession will also hamper investment in energy efficiency and other similar measures to reduce carbon emissions in the medium to long term (source: Cambridge Econometrics, 2010).

- **A shortage of public resources** to implement public policies and environmental programmes – as EU governments face budgetary pressures and weak economic conditions.
- **Relatively weak and poorly-enforced environmental legislation** – Spain (and Extremadura in particular) has been slower than other EU states in implementing environmental legislation. This is demonstrated by the example of the waste management sector in particular, which is explored further below.
- **Low awareness and environmental sensitivity of industry and citizens** – this was highlighted through the study visit and within the diagnostic report. The business survey as part of this review highlighted that on 30% of companies have implemented changes to their organisation in the past 12 months as a result of climate change – the vast majority have not made any changes.

### *Sectoral analysis*

The following sections explore a number of the sectors identified above in more detail. Three sectors, the renewable energy, energy efficiency and waste management sectors are first considered as examples of emerging green sectors with strong potential for immediate job creation. This is followed by a consideration of traditional sectors in transition within the Extremadura economy (agriculture, tourism, and construction), which if policy is correctly focused could be “greened” and make an increasing contribution to the green economy in the medium to long term.

#### *Renewable energy*

Extremadura is already a major generator and exporter of energy – indeed energy is one of the main exports from the region to the rest of Spain. In 2008, 6% of all power generated in Spain was from Extremadura. Of the total generation in the region in 2008, the vast majority (91%) related to nuclear power – a single plant within the region which produces 25% of all nuclear power in Spain (Source: Agencia Extremeña de la Energía, cited in ICENER 2010).

In terms of renewable energy, 7% of total power generation in Extremadura comes from large-scale hydro-electric plants, of which there is an installed capacity of 2 210MW (Source: ICENER 2010). The remaining 2% of power generation relates to renewable energy installations covered by the *Regimen Especial* which covers all renewable energy installations with the exclusion of large-scale hydro-electric. The total installed capacity covered by the *Regimen Especial* was 446MW in 2008, of which 400MW related

to Solar Photovoltaic projects. The Extremadura region has excellent conditions for the installation of concentrated solar power, with very high levels of insolation. Overall, the total renewable energy capacity in the region stood at 2.6 GW in 2008.

As set out in Table 8, there are already over 2 000 jobs in the renewable energy sector in the region. The number of jobs in this sector has increased dramatically in recent years, mainly due to the construction of a number of concentrated solar plants in the region, as is set to continue to grow. The planned deployment of renewable energy capacity in the region will significantly increase the number of green jobs within the renewable energy sector, reflecting wider trends across Spain. The Renewable Energy Development Plan for Spain (2005-2010) estimates that 200 000 jobs could be supported directly or indirectly by the sector by 2010.

Since 2008, there have been some significant investments within the region in concentrated solar thermal plant – a total of six 50MW plants have been developed at a total cost of EUR 1.8 billion. The Energy Agency of Extremadura has produced a set of forecasts for the deployment of renewable energy capacity within the region, based on their knowledge of proposed and licensed projects. Installed capacity is forecast to increase from 2.6GW in 2008 to 3.6GW in 2012 – the main increases forecast to come from Wind, Concentrated Solar Thermal, and Solar Photovoltaic.

As shown in Table 9, the total investment associated with the deployment of an additional 1 000 MW of capacity has been estimated at EUR 3 billion over the period 2008-2012. Estimates have been developed for the potential impact of this deployment in terms of job creation. Based on calculations by ICENER (the

**Table 9. Installed renewable energy capacity in Extremadura (MW)**

	2008	% of total	2010	% of total	2012	% of total
Large scale hydro	2 210	83%	2 210	70%	2 210	61%
Solar PV	403	15%	450	14%	520	14%
Wind	0	0%	200	6%	400	11%
Solar Thermal	0	0%	250	8%	400	11%
Micro-hydro	20	1%	20	1%	30	1%
Biomass	0	0%	15	0%	25	1%
Others – biogas, cogeneration	23	1%	25	1%	27	1%
<b>Total</b>	<b>2 656</b>		<b>3 170</b>		<b>3 612</b>	

*Source:* ICENER 2010.

Energy Agency for Extremadura), over the period to 2012 the construction and deployment of renewable energy projects could support around **7 000 job-years** worth of employment within the Extremadura region (provided that projects are not cancelled or delayed). The vast majority of this is associated with the significant planned investments in Solar Thermal, Solar PV, and Wind.

In addition to these temporary jobs, these projects could create around **1 000 permanent jobs** within the region associated with the operation and maintenance of plants (including supply of fuel for biomass plants) according to ICENER – see Table 10. It is worth highlighting that a significant proportion of the longer term jobs are associated with biomass, which will create opportunities for growth within the agriculture sector (considered below). Whilst the scale of planned investment in biomass is relatively low (EUR 58 million), the labour intensity of this technology on an ongoing basis is high – particularly when employment associated with fuel supply from within the region is taken into account.

Table 10. **Renewable energy – estimated job creation**

Technology	Estimated new capacity		Construction phase (job-years supported)			Operational phase (jobs supported)		
	2008-2012	Investment (EUR million)	Direct	Indirect	Total	Direct	Indirect	Total
Solar PV	120 MW	540	802	480	1 282	40	0	40
Wind	400 MW	480	900	369	1 269	70	57	127
Solar Thermal	400 MW	2 100	3 284	991	4 277	326	96	422
Biomass	25 MW	58	87	43	130	244*	122*	432*
Micro-hydro	<10 MW	14	?	?	74	0	0	0
<b>Total</b>	<b>955 MW</b>	<b>3 192</b>	<b>5 073</b>	<b>1 883</b>	<b>6 958</b>	<b>680</b>	<b>275</b>	<b>1 021</b>

\* Includes employment associated with the supply of biomass and biofuels by local farms/businesses.

Source: ICENER 2010.

The Extremadura region has significant capabilities in renewable energy across all stages of the project lifecycle:

- **Planning and project development** – engineering, architecture, legal, financial, consultation, innovation, research and development, training
- **Manufacture** – primary manufacturing, manufacturing of equipment and components,
- **Installation** – civil works, installation, electrical connection/commissioning,

- **Logistics** – distribution of electricity, transportation
- **Marketing and Sales** – promotion, sales, commercialisation
- **Operations and Maintenance** – monitoring, supervision, inspection, maintenance

The regional authority could support the sector by joining up companies in different stages of the project lifecycle and supply chain in a cluster; such that project developers are more likely to source goods and services locally. The Extremadura region already displays some best practice in terms of sector training and cluster activity. On the one hand, Extremadura has an **Energy Cluster**, led by the Science and Technology Park which represents all energy technologies (with 75 members). The aim of the cluster is to promote the creation, integration and strengthening of energy companies in Extremadura. It is funded by the regional government, but the objective is to make the cluster self-financing within 4 years of operation. On the other hand, in terms of **training for renewables**, an example of best practice is the solar energy installation project run by FONAMA. This is a structured training programme for solar energy project designers, and is supported by ESF funding. To date the project has trained over 1 000 people, and the external assessment of the project was highly complementary. However this is only a pilot programme at present. If continued and established as a permanent project, there is potential to set up a permanent training centre specialising in solar and other renewable energy technologies – and to export expertise to other parts of Spain or even globally.

As shown by Table 10, there is significant potential for job creation within the renewable energy sector in Extremadura. However, it is worth bearing in mind the following cautions to these figures:

- The consultations with local stakeholders highlighted that some of the projects identified may not take place – in particular a number of planned concentrated solar plants have been stalled or cancelled. Anecdotal evidence suggests that these setbacks have been caused by the planned 40% **reduction in subsidies** for electricity produced from solar plant by the national government, and the uncertainty and reduction in project viability this has caused.
- The calculations assume that a very **high proportion of the economic activity associated with the above projects will be retained within the region** – in some cases it has been assumed that 80% of the total investment will be captured within the region. Some caution should probably be applied to these assumptions, as the region may not have the *infrastructure, capacity or necessary skills* to fulfil all tasks in the deployment of these plants.

- Related to this, interviewees (in particular FONAMA) highlighted that the government introduced a regulation in 2006 which requires that 3 permanent jobs must be created per MW of wind installed; and as a result no wind capacity has been deployed in Extremadura.
- Also, it is worth considering that the developers involved in potential projects in Extremadura operate within a **competitive environment**, and are likely to also be involved in renewable energy projects in other regions and countries. Given the identified lack of market capital for large scale renewable energy and infrastructure projects (Green Investment Bank Commission, 2010), this means that any available capital is likely to go to the most financially attractive projects. The reduction in subsidies by the national government is likely to have adversely affected the competitive position of Extremadura relative to other regions within regard to project viability.
- In addition to this, it was clear through the consultations that local people and NGOs within Extremadura have **concerns about the environmental impact** of some energy projects; in particular the potentially negative impacts of wind farm development on birds (which are a key element of Extremadura's unique natural asset base). Local objection to energy development could also be a factor in stalling green energy development in the region.
- Lastly, another factor highlighted by the interviewees was the **lack of any clear direction from regional and national government** about the deployment of renewable energy projects. Anecdotal evidence suggests that changes in government subsidies in particular have created uncertainty within the industry.

However, it is worth stressing that the forecasts presented above only relate to a very short period of time. The long term aim for the region is for renewable energy to provide 22.7% of total final energy consumption (electricity, gas and transport fuel) by 2020 – ahead of the Spanish and EU target of 20% by 2020. Therefore the overall scale of ambition within the medium term is extremely high.

Overall, it is clear that Extremadura already has significant employment and strengths in the renewable energy sector. The planned level of investment in new renewable energy projects within the region will bring additional temporary and permanent economic benefits and green jobs to the region in the short and medium term.

### *Energy efficiency*

One of the potential growth areas highlighted by interviewees is Energy Efficiency. Anecdotal evidence suggests that government and industrial thinking and investment in energy efficiency in the region is some way behind renewable energy – despite the significant expenditure on energy in the region.

National government are beginning to explore this opportunity, and are holding a competition related to the energy management of public buildings. However there is still far more potential for government to promote energy efficiency within its own estate – particularly at regional level. Similarly, interest in energy efficiency within the private sector is generally quite low.

Increased investment in energy efficiency would create a range of new green jobs such as energy auditors and energy managers, would increase the number of jobs in sectors such as insulation, and would also transform several occupations within traditional sectors such as plumbers and electricians, to include an enhanced requirement for knowledge and awareness of environmental issues and standards.

The main barrier to further investment in energy efficiency measures is a shortage of public finance. Political support and resources are required in order to fully realise this opportunity.

### *Waste management*

Another green industry sector which is experiencing significant growth across the EU and Spain is waste management. One of the main drivers for this is new EU, national and regional legislation aimed at reducing the quantity of waste generated, and maximising the reuse and recycling of products and materials.

Across Spain as a whole, waste management is the largest green economy sector, with over 140 000 employees, or 26% of all green jobs (see Figure 2). However, Extremadura has a relatively low number and concentration of jobs in waste management compared to the national figures (1 700 jobs or 16% of all green jobs) which shows the potential to expand activities in this sector.

A number of reasons for this were gathered during the study visit:

- **Policy/Regulation** – a lack of and loose enforcement of waste and environmental management policies. For example, unlike in many EU states, in Extremadura there are no disincentives for landfilling of waste such as landfill taxes. There is also no strategic plan for how to address industrial waste in the region.

- **Low awareness** of the waste management agenda within the public sector and companies in the region.
- **Traditional techniques** within industrial sectors – for example wastes and bi-products from the agri-food sector are routinely incinerated, obviating the need for these to be dealt with by the waste management sector. There have been some proposals for biomass installations utilising agricultural waste and bi-products, but to date these have been relatively small scale.
- **Sectoral composition** – the vast majority of waste is dealt with by a single regional public company which collects all municipal and industrial waste. There appears to be little competition within the waste management sector.

Overall this appears to indicate a significant opportunity for the Extremadura region through the adoption of better waste management policies. This could lead to a number of benefits such as:

- **Reduced waste to landfill**, leading to environmental benefits.
- **Increased level of recycling and reuse**, reducing the need for raw materials (some of which are likely to be imported into the region) and therefore imports.
- **Economic opportunities** through the reuse and remanufacture of materials and products.
- **Overall increase in the number of green jobs** in the waste management sector.

### *Transition of existing sectors*

This section considers ongoing changes and trends within a number of traditional sectors identified as being in transition as a result of the sustainability and climate change agenda.

#### *Agriculture and Forestry*

This is one of the most significant sectors within the Extremaduran economy, with the primary sector accounting for 7% of GDP. The growth in the biomass sector has created a new market for some agricultural products such as timber, wheat and bio-oils. Some farmers are considering the introduction of specific energy crops to supply the biomass sector, however this is limited at present, and the environmental impact of this change should be assessed. Others are also reverting marginal land to forest, as they can then



supply woodfuel to the biomass sector, while some are considering a change of land use to wind or solar. Overall, these changes could create a significant number of green jobs associated with the supply of biomass on an ongoing basis for biomass installations in the Extremadura region or elsewhere. As shown by Table 10, the biomass sector could create more indirect permanent jobs than other technologies despite the fact that the anticipated deployment of biomass is comparatively low (in terms of MWs).

With these ongoing changes in the agriculture and forest management sectors, Extremadura farmers face challenges in terms of maintaining biodiversity, soil quality, and water quality. Indeed, the study visit highlighted the need to find solutions to the tackle the problem related to the toxicity of pig excrement in Extremadura lands, which is damaging the soils for agriculture and water sources. This is a challenge that concerns not only the agriculture sector but also the tourism sector as the landscape might be affected if no measures are taken in the short term. It is also worth considering that the widespread uptake of biocrops may present a challenge in terms of the maintenance of the “dehesa” the traditional farming landscape of the Extremadura region which supports a high level of biodiversity.

Overall, there appear to be a number of changes to the agriculture and forestry sectors which will lead to the transformation of jobs in the sector – creating a need for greater awareness and knowledge of the potential for renewable energy and environmental management. This offers potential to further increase the already significant number of green jobs in the sector in Extremadura, and build on Extremadura’s existing strengths in this area (as demonstrated by the concentration of employment in the sector in Figure 3).

The organisation FUNDECYT could be better utilised in order to meet the needs for transforming existing sectors. FUNDECYT provides information and advice on environmental management to SMEs involved in the agri-food sector through its project EFIMEX. It has been operating since 2008, since when it has provided information to 2 000 SMEs, provided advice to 15 companies, and carried out 90 short diagnostic reports on companies’ environmental management policies and practices.

### *Construction*

The construction sector in Spain has gone through a boom in recent years, but has suffered a sharp contraction due to the economic recession. It has been estimated that there are now 622 000 unemployed construction workers in Spain (GHK, 2009). Due to the sharp contraction in construction work, many construction firms have diversified into the renewable energy sector, to take advantage of the growth in demand in this sector.

Construction workers are also looking to shift to the renewable energy sector. The government has established a number of specific training programmes to assist construction workers in making this transition. For example ICENER offer courses for construction staff looking to work in renewable, and offer support for firms looking to diversify into the sector. However one of the risks identified during the study visit is that many general construction workers have relatively low skills levels, and therefore find it difficult to engage with the renewable energy sector. In many cases, retrained construction workers do not have sufficient background knowledge in renewable energies, and become tied to specific renewable energy technologies.

Another trend within the construction sector is the emergence of sustainable construction techniques and technologies. During the study visit it has identified that there has been a growth in demand from consumers for energy efficient and sustainable homes. This is supported by some government regulations, for example a requirement to install solar cells when carrying out building refurbishments. However, during the study visit it was identified that the latest Technical Building Code does not support the use of traditional construction methods and materials, which are perhaps more sustainable in use than modern methods such as steel frame and concrete.

Overall, the construction sector has suffered a sharp contraction as a result of economic recession, but the shift towards sustainability and climate change mitigation provides opportunities for diversification of the sector and retraining of workers.

### *Tourism*

Tourism is one of the key economic sectors in Extremadura – specifically eco-tourism associated with the region’s significant natural assets, which has grown in importance in recent years. The region natural assets can be summarised as follows: one third of the region is a protected nature reserve, with 169 protected biodiversity areas in the region; and one third of birds at risk within Europe are present in the region.

Until around 5 years ago, there was no official government stance on eco-tourism, but it is now being promoted as a sustainable growth sector. Monfragüe National Park is now the second most visited attraction in the region with 400 000 visitors per annum. Since 2000 the number of hotel beds in towns around Monfragüe has doubled. In part this is due to the creation of a regional state-owned network of high-quality 4 star hotels (“Hospederias”) in all of the important nature locations in Extremadura, similar to the “Paradores” network at national level.

There are a significant number of firms engaged in active tourism in the region (interviewees suggested around 50 firms in the region). This is being

assisted further through the creation of the *El Anillo* sports institute which expects to attract a significant number of tourists (namely adventure tourist) to the region. The regional government is also looking to further enhance existing natural assets – such as the creation of the Tajo/Tejo National Park in conjunction with Portugal.

Overall, the growth in activity within the sector is creating a demand for two broad types of additional jobs:

1. Specialist jobs including tour guides – these require specialist skills including a high level of environmental knowledge. This could be considered “job creation” as set out within the framework mentioned before.
2. Non-specialist jobs for example housekeepers, waiters, cleaners, etc – which only require a relatively low level of environmental awareness. This could be considered “job transformation”.

## Challenges and opportunities

The following analysis summarises the Strengths, Weaknesses, Opportunities and Threats for the growth and the creation of jobs in the green economy in Extremadura:

### *Strengths*

#### *Renewable energy capacity*

Extremadura has a history of energy production. The region has existing renewable energy capacity including cutting edge technologies such as concentrated solar thermal. The region has well-established networks such as the Energy Cluster and the Science and Technology Park. The planned Iberian Centre for Renewable Energy will be located at the Science and Technology Park, further enhancing the region’s capabilities. The region has an excellent supply of labour with skills in renewable energy.

#### *Natural assets*

Extremadura has a significant offer in terms of its natural environment – in particular its National Parks. The natural assets are already a draw in terms of visitors to the region. The region also has a strong agricultural heritage, and a reputation for producing high-quality agri-food products. The region has a low population density, and low pressure on land – which provides an excellent opportunity for change of use and diversification.

## ***Weaknesses***

### *Lack of awareness and understanding of the green economy*

There is a lack of awareness of the green economy in the region. Whilst the region has some strengths, stakeholders appeared to have a limited view of the green economy, and not consider its full potential. There appears to be a disjoint between “green” and “economy” within the region – with many business people stressing the administrative burden associated with the environment, whilst failing to identify the associated economic opportunities. There appears to be a lack of awareness, understanding and interest in environmental issues in some quarters. Anecdotal evidence suggests that there is limited consumption of eco-products in Spain at present. Finally, there also appears to be a lack of understanding within industry and the public sector about the definition of the green economy and green jobs.

### *Peripherality and population dispersion*

Extremadura suffers from having a relatively low population density, with few concentrations of population and relatively poor transport links. The connectivity and profile of the region is relatively low on a national and international level. Whilst the region has some excellent skills and expertise in green economy activities, these are poorly recognised or articulated at a national or international level. This is further hindered by the relatively low level of awareness of green economy activities within the export promotion agency.

### *Lack of professional, entrepreneurial culture*

The Extremadura region generally suffers from having a lack of entrepreneurial culture. Workers often lack practical knowledge, and there is a lack of incentives for entrepreneurial activity. Economic activities are not sufficiently developed or professionalised.

## ***Opportunities***

### *Renewable energy*

There is significant economic opportunity associated with the deployment of new renewable energy capacity in the region. Within the short term, there are a number of significant proposals (in particular solar thermal) which could potentially create thousands of jobs in the region. Due to ongoing training programmes, the region has labour market capacity and the necessary skills to meet this demand.

### *Sustainable procurement and operations in the public sector*

There is a significant opportunity for the public sector to drive change through sustainable procurement and investment in energy efficiency. The recently published Green Procurement Plan for Government Agencies (2008) may create a new stimulus for green products and services. There is also a growing emphasis on energy management and efficiency in public buildings, which could create demand for environmental goods and services. The potential of green procurement to support the development of a green economy is further analysed in chapter 5.

### *Construction*

Whilst overall the construction sector has suffered a sharp contraction as a result of economic recession, the shift towards sustainability and climate change mitigation provides opportunities for diversification of the sector and retraining of workers, and the creation of green jobs.

### *Agriculture and forestry*

The region already has a high concentration of green jobs in the eco-agriculture and forest management sectors (compared to Spain as a whole). The region has an opportunity to further enhance this position through the supply of new products to green sectors – for example the supply of biomass crops and biofuels to the biomass sector. The deployment of biomass installations in the region and elsewhere in Spain will create a demand for the supply of feedstock. Extremadura is extremely well-placed to capitalise on this opportunity given the significant extent of agricultural land in the region.

### *Management of natural spaces and eco-tourism*

The region has a high proportion of green jobs in the management of natural spaces, which to an extent is unsurprising given the extent of environmentally-designated areas in the region. However there are plans to further increase the extent of designated areas (such as the creation of the Tajo/Tejo national park). Furthermore, the need for environmental management and interpretation will increase due to the increasing demand for eco-tourism in the region.

## ***Threats***

### *Focus on renewable energy*

It is clear that Extremadura has great potential in renewable energy, and local businesses and policymakers are working hard to capture new jobs in this sector. However there is a risk that the focus of renewable energy is to the exclusion of other sectors which also have growth potential, and other sectors are not given the resources required to capitalise on opportunities for growth. Renewable energy should be one of a suite of sectors which are considered by the regional government and regional businesses.

### *Weak university offer*

The university offer and expertise is not sufficiently aligned to the needs of the Extremadura economy in general and less so to the new demands of the green economy. Also, there is limited joint working between the university, other public sector partners, and industry which hinders the expansion of added-value sectors and limits the up-skilling of the workforce in Extremadura.

### *Failure to capture economic benefits of major projects*

Whilst there are a significant number of renewable energy projects coming forward in the region, there is a risk that the region fails to capture economic benefits if the supply chain in the sector is not ready to absorb the demand. There is a risk that project developers import skilled labour from other regions, and do not utilise the existing skilled workforce within the region. There is also a risk that developers import major components and materials from other regions, thus allowing economic benefits to leak out of the region.

## **Recommendations**

Based on the above analysis, the following recommendations for Extremadura on the creation of jobs in the green economy can be drawn. This section sets out the key recommendations for consideration.

### ***Define green economy and green jobs***

#### *Develop common vision for the Green Economy*

At present there are many competing views on the scope and extent of the green economy in the region – both within the public sector, NGOs and businesses. The regional government of Extremadura should develop a

common vision and working definition of the green economy and green jobs, and undertake further research on the extent and nature of green jobs in the region. The regional government should identify and publicise opportunities within the green economy to local businesses.

### *Be the national leader on updating job-profiles*

The study visit highlighted that the Public Employment Observatory have considered whether the national database of job profiles could be updated to reflect changing job profiles in traditional sectors. There is an opportunity for Extremadura to lead national government in updating the database of job profiles. This could be achieved through consultation and research with local firms on the nature of green jobs, to identify how generic role profiles should be adapted or enhanced. This information, if gathered timely and with good quality, could allow Extremadura to become the national reference on job profiles in the green economy.

### *Support to the renewable energy sector*

#### *Create a regional renewable energy strategy*

At present, there is a lack of leadership on the direction of the renewable energy sector in the region. The regional government should establish a regional renewable energy strategy, with clear government commitment to specific technologies and locations for renewable energy deployment, and certainty over subsidies for renewable energy deployment. This could be developed by the regional government in partnership with the Energy Cluster and local firms.

#### *Establish permanent renewables training centre*

An example of best practice from the Extremadura region is the FONAMA solar energy installation training project. The funding for this project should be continued, and the regional government should investigate with FONAMA and the Iberian Centre for Renewable Energy the potential to establish a permanent training centre in renewables.

### *Supply chain development*

There is a risk that the region may fail to capture the full economic benefits arising from large-scale renewable energy projects in the region. Supply chain opportunities for renewable energy firms in Extremadura should be maximised by lobbying renewable energy developers associated with large projects in the region, undertaking supply chain development activities, and producing a supply chain directory for the region.

### *Biomass sector development*

The regional government should support the development of a network of biofuel suppliers in the region; working with local agriculture firms and cooperatives. This will ensure that the long-term jobs associated with the supply of biofuels to biomass installations in the Extremadura region are captured locally. The development of the supply chain could be assisted through grants for SME development, and the development of a directory of biomass feed-stock suppliers in the region which can then be marketed to project developers.

### *Encourage investment in energy efficiency improvements*

#### *Public sector lead on energy efficiency*

The regional government should make a commitment to manage and reduce the energy use associated with its own estate. This should be specified in terms of long term goals for the reduction in energy use and carbon emissions, together with annual reduction targets. One way to facilitate this is by improving finance for public sector investment in renewable energy and energy efficiency, through an “invest to save” programme or revolving fund. Another suggested approach to incentivising investment in energy efficiency is to allow public bodies to retain a proportion of any reductions in energy bills as a result of investment in energy efficiency – which they can then spend as they wish. This model has been utilised within the Euronet 50/50 project run by Intelligent Energy Europe to save energy in schools (for more information see [www.euronet50-50.eu](http://www.euronet50-50.eu)).

#### *Promote energy efficiency improvements in the private sector*

Provide support to strategically important businesses and SMEs in the region to increase awareness of resource and energy efficiency, and promote the uptake of low carbon products and services. Experience from programmes elsewhere is that significant improvements in private sector energy efficiency can be achieved through the provision of information, best practice case studies, advice, guidance and implementation support (in the forms of consultancy support or finance).

### *Develop waste management framework*

#### *Support waste management development*

Extremadura has an enormous potential to develop the waste management sector, which will lead to the creation of a number of well-rooted jobs in the long term. The region of Extremadura has relatively weak waste



management legislation, and it is poorly enforced. As a result, the waste management sector in Extremadura is behind other regions in terms of scale and level of sophistication. The regional government should improve enforcement of existing waste management legislation, and consider the introduction of restrictions or taxes on land-filling, in order to encourage an improvement in recycling rates and growth in employment in the waste management sector.

The economic benefits of the waste management sector are demonstrated in the case of the City of Peccioli in rural Italy, see the Annex A. The municipality has generated significant profits from a local landfill and energy from waste plant – using waste from neighbouring municipalities. This supported local jobs and investment in local public services. In 20 years, this operation has generated over EUR 250 million and created 300 jobs directly and indirectly. The project was managed as a collective by the Mayor and local community.

## Notes

1. It is important to highlight that the OECD does not have a definition of “green jobs”. For the purposes of the current OECD LEED project, the term used is “greener jobs” or else jobs in the green economy. However, this term in the context of Extremadura is drawn from work carried out by Spain. It is therefore utilised in this report as utilised in the Spanish report.
2. Description of a Location Quotient - If the concentration in employment in a sector is the same in Extremadura as in Spain as a whole then a Location Quotient value of 1 is given. A higher value shows a concentration of employment in the sector in Extremadura relative to Spain as a whole.

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## *Chapter 4*

### **Developing green skills in Extremadura**

by Lisa Rustico

*This chapter analyses the situation of Extremadura in the context of the development of green skills to meet the demands of a greener labour market. This is organised into various sections. After a brief introduction, the first section is dedicated to green skills development in Extremadura: a description of the state of the workforce and of the initiatives for its green development brings in the analysis of the expected changes in job profiles and new skills needs, while also addressing new green skills' demand and supply, their (mis)match and how this can be tackled in the private and public sector. The second section identifies the strengths, weaknesses, opportunities and threats of green skills development. The third section offers a number of policy recommendations for the region of Extremadura.*

## Policy issues

The global shift to a low-carbon economy is deeply influencing current and future labour market needs, also in terms of training and skills needs, and job profiles development.<sup>1</sup> Climate change will impact on the labour market both directly and indirectly through new legal and regulatory frameworks and by changing consumers' habits.<sup>2</sup> As a major consequence, new jobs will be created; others will be destroyed, while new ones will substitute some others. What is likely to affect all jobs, though, is a change in skill needs, day-to-day methodologies, work organisation and process management.

On the one hand, new jobs will require new qualifications, at the forefront of technological development and innovation, especially in sectors such as renewable energies, transport, etc. On the other hand, existing job profiles in many other sectors – if not all sectors – are going to be redefined in their skills and training requirements. This is the priority that many countries, especially in Europe,<sup>3</sup> are addressing in order to enable the shift to a greener economy.

The importance of developing the right competences for green jobs has an economic rationale: skills mismatch – in terms of skills' gaps and shortages, over- and under-qualification – might hamper the creation of good jobs, therefore hindering a quality shift to a greener economy. As a result, investments and stimulus packages for green economy might eventually prove to be inefficient, with local governments cutting funds for green policies and companies not engaging in green growth paths. Skills and workforce development is a priority issue for enabling green growth, not only for those jobs directly linked to eco-industries but also for all jobs, with different “shades of green”.<sup>4</sup> As an answer to this challenge, training can be a powerful lever to engage all workers in the fight to climate change.<sup>5</sup>

Continuous vocational education and training for adult and older workers, but also initial vocational education and training and early stage education, need to become greener, in order to disseminate information, spread knowledge, and support competences' development to the whole population. Green skills development mainly consists in adding a green shade to existing knowledge, skills and competences, and placing emphasis on core skills in science, technology and mathematics<sup>6</sup> and on generic skills. Therefore, greening the workforce entails the acquisition of greened knowledge, skills and competences at all levels, building upon awareness, motivation and commitment to contribute to an eco-sustainable development model.

Moreover, green skills are going to be provided through a mix of training methodologies and they will cover a wide array of levels catering for either the high-, medium- or low-skilled.<sup>7</sup> While traditional training supply is widespread, a shift to more company-based training for green skills is taking place, as firms provide in-house training, although this is often short in duration and hardly recognized by formal qualifications.<sup>8</sup>

Nowadays learning develops in the so-called “learning eco-system”, including schools, companies, VET providers, stakeholders at the local level where strategic skills development schemes are embedded in partnerships and integrated systems. Furthermore, although local governments play a fairly marginal role in designing climate change regulation, they are in charge of implementing the policies and of enabling green growth by managing the impact of climate change on the labour market. Among the levers for such management, active labour market policies, such as training and skills development, are key to ease the transition to the green economy. Hence, adequate information on green issues should be disseminated through all possible means, ranging from the institutional levels (government, social dialogue, public education, etc.) to media and social actors. Also, the preventive adoption of adequate training policies for workforce green skills development is a priority that cannot be disregarded by any country, to ensure the existence of adequate skills within the labour force.

## Analysis of Extremadura

### *State of the workforce in Extremadura*

The picture of the labour market in Extremadura reflects the typical features of Mediterranean countries: the workforce of the region registers relatively low employment and activity rates, and relative gender imbalances, which are reflected also in the high levels of unemployment (see chapter 1). Therefore, job creation has been addressed among the top priorities for the country. The Government of Extremadura recognized the importance of greening existing and new jobs, contributing to the shift to a low-carbon economy.

Data shows a correlation between the level of education and employability chances in the labour market; in particular, graduation in the field of science guarantees more job opportunities: 87.78% of the workers with a background in this area, find a job without difficulty (see chapter 1). Dependent workforce prevails over self-employment, as most of the workers in Extremadura are employed in SMEs. Hence, workers’ development is likely to occur in the workplace, in informal and non-structured settings, with the consequent need of making learning visible and of better orientating learning outcomes. Formal training opportunities are widespread in Extremadura but a number of obstacles threaten its effectiveness and quality.

One of the main challenges regarding the state of the workforce and labour relations in Extremadura is the mismatch between labour demand and supply. Besides formal data on qualification levels, labour market stakeholders highlighted a paradoxical contrast between the availability of qualified

people, holding secondary and tertiary degrees especially in some sectors, and the unsatisfied skills needs of the labour market, especially in green sectors, particularly in the primary sector and at all levels.

With particular reference to green skills, a key feature of the state of art of Extremadura workforce development is the lack of proper awareness of what it is really “green”, and the consequent uncertainty on which priorities, actions and skills would enable the shift to a greener way of doing business and working. Employers themselves, especially in the primary sector, are often unaware and scanty informed about training provision for greening the workforce and its impact on the local economy. However, the experience of a number of employers in the region shows that greening the workforce often occurs in tacit ways, without involving in formal training and courses. By the way, the region holds a relevant potential in terms of training provision for workforce development, which could be developed for preparing today the workforce for jobs in the green economy.

### *Initiatives for green workforce development*

When analyzing Extremadura’s initiatives for workforce development, the abundance of training supply and training providers clearly emerges. On the one hand, this risks disorientating employers and employees among the plethora of training initiatives, courses, funding opportunities and skills development programmes. Extremadura could facilitate the identification of support schemes for the green economy in one single spot. On the other hand, the large quantity of initiatives for green workforce development represents a comparative advantage for Extremadura to set up, organise and systematise a consistent and efficient training system for green jobs. Among the strategies for green workforce development, including information campaigns, formal training initiatives, educative actions, Extremadura mainly needs more awareness raising and information on what is “green”. Furthermore, curricula at all qualification levels should be revised in their content, in light of effective skills needs expressed by companies at the local level.

Among the main initiatives for green workforce development in Extremadura, **FUNDECYT**, the private – but supported by the public government – Foundation for the Development of Science and Technology in Extremadura, promoted EFIMEX. This is a project aiming at supporting SMEs access to eco-friendly practices, especially continuous training and awareness rising among workers and employers in SMEs, including micro companies. The main outputs of EFIMEX were training actions and sectoral studies concerning workforce development; in particular, four workshops and eight on-line distance courses. Workshops were organised for raising awareness on financing for green development, new employment in renewables, energy transformation in biomass, energy resources and energy scarcity.



On-line courses, free for inactive workers and self-employed people, were open to a minimum of 40 participants. The EFIMEX project concluded that awareness raising actions need to be strengthened.

From the study visit it emerged that training curricula for workforce development is defined without any or very little analysis of real skills needs. Evidence showed that this was partly due to the restrictiveness of EU funding, which did not allow enough flexibility in planning training provision. Furthermore, training is often limited to informative sessions, without proper training for skills development, also due to the lack of properly skilled trainers. Another major finding of the study is that greening the workforce may require e-skills, since a number of training actions are provided on-line.

The Scientific and Technological Park of Extremadura realised another important initiative for workforce development, especially from the point of view of self-employment. The Park fosters workforce development for the creation of new enterprises in green sectors, building upon the valuable resources of the region; to this end the Park works with sectors and clusters for analysing skills needs, it provides training, both in class and e-learning. The Park helps firms, especially from the energy sector, to re-orientate their activities into new sectors, namely clean energy (nuclear, hydroelectric, solar thermal and photovoltaic) and to create added value, both in services and in products. The Park cooperates with technological centres, and also R&D departments in the University, in particular with the ICT department applied to green energy, for improving products and services in energy efficiency, flow control, etc. The Park provides companies and start-ups with scientific advice but also with auxiliary services, such as accountancy, human resources, legal advice, strategic planning, etc.

The Scientific and Technological Park focused on a “three T” model for workforce development in Extremadura, based on Tissue (*i.e.* network), Talent and Treasury. It also revealed a number of barriers, namely the lack of lifelong learning attitude and the scarcity of talent on the territory of the region, also as a consequence of the low capacity to attract and retain human capital, through incentives and wages policies. However, this spin-off revealed a strong potential for Extremadura to work at the medium- and high-levels of technological advancement: Extremadura generates energy for four million people but it has only one million consumers; therefore, workforce development should focus on more and better skills and competences for exporting products, skills and technology, while not only goods, *i.e.* kilowatts. The initiative finally highlighted the necessity of building a stronger dialogue between Universities and businesses, with the former providing companies with talent, know how, research and applied research.

Evidence gathered during the study visit demonstrates that there are still to be developed proper green sectors in the labour market in Extremadura.

To tackle this problem, SEXPE in agreement with FONAMA (Fomento de la Naturaleza y el Medio Ambiente) launched an initiative for workforce development in 2009. From January to November, FONAMA developed a project for workforce development, funded by the European Social Fund. The first phase involved over 1000 people, trained as new renewable energy specialists, mainly photovoltaic, thermal solar and wind energy installers as well as renewable energy project managers. The second phase of the programme is training 780 renewable energy installers and 420 solar installations project designers through 80 courses. Trainees have mainly been professionals from the fields of construction, electric installations, plumbing and heating. FONAMA's training for designers is provided through 28 courses in the Extremadura region. Each course is 125 hours and trains 15 workers. Courses are oriented towards workers in the construction sector, preferably employed in SMEs or self-employed [CEDEFOP, 2009].

Even though the outcomes of these training actions in terms of skills development and job placements were not always clear, the project revealed that continuous training is a major problem in Extremadura, notably because of the wide territory, which makes it difficult to reach all people, especially in small villages. Creating micro-centres for training at the local level, however, is not a feasible solution as it contrasts with modern training policies' trends, which shift the perspectives from training inputs (centres, institutions, courses, etc.) to learning outcomes. In this perspective, the positive training action undertaken by FONAMA could be extended to the whole region if new didactic instruments were considered, such as e-learning, and if systematic assessment and monitoring on learning outcomes took place.

### *Expected changes in job profiles*

According to the Regional Government of Extremadura, all jobs are going to be greener: new jobs will be created, especially in new sectors like renewable energy production. Similarly, jobs from existing sectors, which already do have green elements, but have been affected by climate change policies, will also change (eco-agriculture, eco-tourism and construction); finally, traditional sectors without proper green elements will acquire green shades, in terms of day-to-day working methodologies, work organisation and processes. As a result, all job profiles are going to change, as a consequence of binding regulations, productive standards and labelling rules, set at different governance levels. This confirms the most recent trends in literature regarding green jobs and green skills, which do account for a greening of all occupations, as inescapable condition for shifting to a low-carbon economy.

In order to green job profiles, the biggest potential of Extremadura lies in adding green elements on existing skills of both new and traditional sectors

at the local level – in particular, agriculture, tourism, and construction as identified in chapter 3. All three sectors, though, registered the common lack of skills for the responsible management and use of different resources, a stepping stone for local development. In particular, expected changes in job profiles will require knowledge, skills and competences for enabling the industries of the region to complete the value chain of many productions, from natural resources to retail, in order to make Extremadura a provider of knowhow and not only a producer of goods and services. Technical knowledge, entrepreneurship, negotiation attitudes, communication and linguistic abilities, e-skills, creativity and interpersonal competences are identified as the key drivers of expected changes in greener job profiles in Extremadura. As an example, the stakeholders of the region suggested that agro-food products grown in the “dehesa” – a special land of Extremadura – and through eco-friendly processes, be recognized and sold with a green label, for example “Natura Extremadura”. To the same end, dead lands should be revitalised and better promoted on international markets, with due respect of the environment and the regional history. Therefore job profiles should be enriched with transversal competences empowering the workforce to be more proactive in the management and active interpretation of their jobs, also identifying what elements would make them greener.

Coming to the three sectors identified above, firstly, in agriculture the agro-food value chain can be modernized in its infrastructures and production methods – especially referring to wood, coal, ox, wild mushrooms – in order to create an Extremaduran industry, able to trigger local development. Training should involve employers, in order to get them engaged, motivated and interested in easing the process of change, but also employees, by acquainting them with knowledge about new materials, and production methods that respect the environment. In Extremadura, many farmers in still apply techniques and methods that are not friendly to the environment, for instance with respect to olives production and vineyards, in so far as they have an adverse effect on biodiversity and base on intensive agriculture principles. In order to green existing job profiles in agriculture, the Regional Department of Agriculture and Rural development manages four centres for vocational education and training. These centres organise courses for technicians in the sector, annually funded with EUR 7 500 000. Training curricula are designed according to the training needs of each centre, ranging from watering crops, wine yard protection, new machineries and viticulture. Job profiles in agriculture should adapt to modern organisational models (*e.g.* districts or cooperatives) where knowledge, machinery and infrastructures are shared. Training facilities and resources could this way be easily shared and maximised, responding to the local lack of qualified labour force locally.

Secondly, construction is a labour intensive sector offering the possibility to absorb considerable shares of the working population in the region, easily

adapting job profiles from the traditional construction sector to more eco-friendly practices in the sector (eco-building or eco-construction). Ancient construction techniques, natural resources, processes and materials available in the local environment, are energy efficient, safe for people, and they would serve old and historical buildings renovation. Using local resources, eco-building can boost indirect employment, by also preserving the regional heritage. One example is the construction of volts, carried out with natural materials and ancient techniques. Nevertheless, the lack of a legal framework in the field of building and the lack of training centres and competent trainers emerged as major obstacles for adapting existing job profiles to new needs in the eco-building sector.

Thirdly, tourism has a considerable green potential in Extremadura, due to the natural heritage of the region: one third of the territory is protected by law, due to the richness and the high potential of the regional territory in terms of environment, water resources (one third of the national basin), fauna and vegetation. Nevertheless, several stakeholders registered a lack of knowledge and qualifications for job profiles in this sector, especially with regard to specialized jobs both at the management level and for employees. Job profiles need to be updated and adapted to green development also in light of already existing initiatives and activities in the region (for example, the park in Monfragüe, which also hosts an institute for biodiversity, on the international park Tajo-Tejo, at the border of Portugal). The competent regional Department expects job profiles in tourism to become more specialized, at all levels (from managers to white collar jobs), yet without requiring academic qualifications. Expected changes are also linked to the development of new kinds of tourism, which requires new goods and services: active tourism, environmental sport and leisure activities, all related to nature. As an example, the mountain guide is a job profile that will be redefined and adjusted in a greener way, and it will require additional knowledge and awareness about environment protection. The job profiles of tourist guides, biologists, environmental scientists, tourist operators, employees and managers in services and cultural facilities will also need to change, to attract tourists, without impacting on the environmental equilibrium or ruining the landscape.

Finally, as far as new green jobs are concerned, these concentrate in renewable energies, mainly solar energy, including solar thermal and photovoltaic; during the study visit, biomass and biogas were equally recognized as two fast growing industries in the region. In Extremadura, renewables' small and medium enterprises retain a strong potential for creating richness and contributing to people's and resources' development. Numerous existing job profiles, today common in the region, can be easily adapted to renewable energy sector's needs. In particular, plumbers and electricians can adapt their jobs to renewables with courses in installation and manufacturing; but also job profiles from the construction industry can easily fit green companies'

needs, with updated technical competences. Soft skills, however, represent a major requirement for all job profiles, in particular, communication abilities. Job profiles in renewables will require new content and knowledge, but also day-to-day methodologies, with the general aim of increasing the value of local resources. However, job profiles should develop in a flexible way and they should be adaptable to changes in funds availability and in regulations.

In order to analyse, anticipate and forecast changes in job profiles, a comprehensive and consistent system in the region is lacking, although different stakeholders in various sectors collect data and share information. There is also an excess of information and a lack of coordination, which make it difficult to guide, encourage and enforce workforce development for green jobs. In absence of a clear picture of training and skill needs, companies struggle to plan business actions and create new jobs.

### ***New green skills needs and shortages in the public and private sectors***

As recorded by existing literature, green skills are mainly traditional skills, adapted and adjusted to the new needs, values, priorities and market actors of the green economy. In Extremadura, both the public and the private sector are spearheading considerable efforts for greening their services and jobs but more could be done in terms of skills development and workforce adaptability. As a support to green skills development, and besides green skills needs and shortages, the regional economic actors also expressed the need of more basic information and training, both in the public and the private sectors.

In this respect the first priority for Extremadura is raising awareness around green development at the local level, linking regional problems to wider global challenges. In particular, information should better focus on the definition of green development, stretching its borders well beyond the protection and promotion of the natural heritage of the region. In particular, sustainability is commonly extended to sectors like proximity services (residence, health care, etc.) as they would help social sustainability. Stakeholders need to become more aware and informed about the scope of climate change challenges, which entangles the greening of all jobs, without confusing environmental challenges with broader social goals. The lack of sufficient awareness and interest is demonstrated, among other elements, by the absence of programmes for supporting firms' adjustment. By the way, businesses and stakeholders often consider the "green" element more as a cost than as an opportunity or even an environmental and social duty. In order to achieve these results, educational actions for raising awareness have been undertaken in the region for people at every life stage, in the perspective of lifelong learning.

However, information and notions do not coincide with human capital formation. The second priority for Extremadura indeed is catering all workers – public officials, entrepreneurs in the private and public sectors – with green competences. Becoming a green-competent worker, involves every task in all jobs, throughout all the sectors of the economy in the region. In order to develop competences, informative sessions – be them in class or via e-learning – are not enough. As remarked by the regional Department of Youth, in Extremadura skills gaps in some sectors flow from a lack of qualified training, which can meet the local needs of the sector. Non-formal and informal learning, seminars, self-training, work-based learning would be better to adapt and up-skills job profiles in the sector in Extremadura.

Moreover, with particular reference to the public sector, all stakeholders highlight green procurement as a priority. Managing public funds is an onerous activity and it involves massive amount of workers in the region: if green procurement was more developed and spread, this would help saving costs, energy and possibly help in the fight to climate change. Green procurement is something that touches upon also the private sector, although this is far away from Extremadura small companies' perspective, as they express interest in green issues in so far as they represent a business opportunity, and especially if this is linked to projects involving hard sciences such as engineering.

Coming to more specific skills needs, summarizing the findings of the meetings during the study visit, the General directorate of training for employment identified a clear set of skills for making all jobs sustainable: e-skills, linguistic and communication abilities, green awareness. Interviews with the Energy cluster helped identifying the mix of ideal skills in this sector, namely: entrepreneurship, project management, organisation, linguistic abilities (especially English), and ICT skills. Entrepreneurship, in particular, is lacking, not only among young people but also in the adult entrepreneurs, which do not venture in new green sectors or in greening supply chain of existing sectors. In order to foster entrepreneurial skills, the offices of self-employment promotion of the Network of employment and local development agencies of Extremadura are working with primary and secondary school to promote a programme called “Imagina tu Empresa”, for entrepreneurship development. The project proved to be successful as it was replicated in six editions, involving thousands of secondary school students, who presented hundreds of projects to be evaluated by a national jury.<sup>9</sup> The project aims at achieving a number of positive results, like fostering youth entrepreneurship and promoting imagination and creativity within education institution.



### *Matching new “green” jobs demand and supply*

Besides the plethora of training opportunities in Extremadura, one of the major obstacles to effectively greening the workforce is the mismatch between labour demand and supply. This results from the lack of a clear picture of skills needs in the region, which partially flows from the fragmentation of the training system articulated on the territory. In spite of positive – though isolated – initiatives, the problem of skills mismatch is due to a systematic lack of information about labour demand and supply, aggravated by the traditional separation between education and training system, which is common not only in the Extremadura but in many other OECD regions.

As remarked by ADENEX, there is still a mindset that separates education and the labour market. Such epistemology leads to the lack of successful pathways of young people into the labour market, especially in green sectors, which are mostly unknown to companies, schools and universities. The main problems concern teenagers quitting the school system or graduates in biology and natural sciences, but also adults involved in recurrent job-to-job transitions. ADENEX, as part of the Rural Development Plan of Extremadura 2007-2013 facilitates the dialogue between enterprises and the regional government. Among other services, ADENEX offers graduates in biology and environmental sciences guidance and counselling services, best practices, and it creates a platform for information exchange among students and young people.

The Extremadura Public Employment Service (SEXPE) provides an innovative vision for matching skills demand and supply, since it promotes training integrated with job placement and other auxiliary services with an informative function. The employment offices offer services of counselling, guidance, professional orientation and labour intermediation, involving 130 job orientators across the region, also helping people obtaining information on different typologies of green jobs. SEXPE also acquaints workers with competences to build a career path to good jobs in green sectors; for instance, in 2009 it carried out over 40 training courses for technicians of renewable energies but also for rural workers. SEXPE also carries out analysis and studies on active employment policies at the local level to explore the employment and growth potential of green markets, working for the promotion of labour market policies with mancomunidades (group of cities/ towns in Extremadura), developing information services and workshops to identify skills needs and better matching jobs demand and supply. In order to better match jobs demand and supply, SEXPE manages a number of tools such as groups of active job search, interviews and sessions of information and motivation for self-employment. Weak bands of the labour market like prisoners, youngsters and women, among others, receive tailor-made programmes.

Finally, SEXPE, through its 41 public employment agencies, is working hard and with positive results for green employment growth. Main levers of SEXPE at the local level are active labour market policies, including training, intermediation and orientation, but also services like skills certification, awarding qualifications, and other tools for labour market transparency and better matching of demand and supply.

### ***Up-skilling or re-skilling programmes and the potential of greening curricula***

There is a margin for greening curricula in the region, both in vocational education and training, and at higher education levels, but this cannot be exploited without a real connection of the education and training system with the labour market and its stakeholders, starting from social parts.

As far as VET is concerned, Extremadura has a solid tradition in a number of programmes for alternating school and work, such as the so called “Escuelas Talleres”, workshop programmes, and other nationwide training initiatives created in the “80s and managed by the General Directorate of Training for Employment. The aim of “Escuelas Talleres”, for instance, is enhancing young people’s employability, lower drop-out rates, and save craftsmanship and traditional jobs in the region. Nowadays these workshops are managed by Autonomous Communities, with the aim of improving the employability of young unemployed people. The outcome of these programmes is not only up-skilling and increased employability, but it also works like a social service, as the phase of training concludes with a temporary trade linked to the recovery of regional heritage, or services to the community. In 2009 most participants chose programmes in the field of building and civil edification (48.04%), agriculture (18.34%), hotel management and tourism (around 8%). Training activities focus on “eco-sectors”, *i.e.* construction, agriculture and tourism, although training for green skills should be organized also for making other economic sectors and occupations greener.

Greening curricula is possible in Extremadura through the “Green Jobs Training” programme, launched by the Extremadura Public Employment Service (SEXPE), offering training for sectors with the potential of green jobs creation, such as: ecological agriculture and cattle breeding, forest and natural spaces management, management and treatment of waste, environmental services to companies, environmental training and education, tourism and hotel business, information and communication technologies. The Green Jobs Training programme has been created in light of the awareness of the information’s need about how to promote green jobs and how to maintain that job.

At the tertiary level, the role of Extremadura University in the transition to the green economy should be more emphasized. On one side, a stronger



and continuous dialogue with business communities would help and orientate students, also towards self-employment; this can be achieved thanks to the contribution of the Extremadura Business School. On another side, curricula in different faculties are still far from changing, as there is a lack of green component across teaching modules. Besides formal qualifications for what is believed as “green” (for instance *Diploma en turismo*, Degree in tourism), substantial change in the university curricula still lacks.

## Challenges and opportunities

Greening skills is a priority to make all jobs greener and involve all workers in greening local development, building on local capacity. However, in Extremadura, the regional training system and the conception of training itself should change for systematically improving their quality and effectiveness. More and better information and awareness, starting from early stages education, would clarify what are the shades of “green” in the local labour market. This would permit to design targeted policy measures for skills and workforce development. Training provision and resources need to be rationalized and better organised in the regional territory, flowing from a consistent analysis of the real skills needs.

Moreover training supply needs to shift to a learning outcomes and competence-based approach. Training provision should be articulated with different learning and didactic methodologies, prioritizing on-the-job and work-based learning. In order to improve the effectiveness of training investment, Extremadura should develop skills audit and validation of non-formal and informal learning. Not only needs the Extremadura labour market new skills for new green jobs, but all jobs require a greener adaptation of existing knowledge, skills and competences. To this end guidance, counselling and placement services may enhance workers’ employability in a greener local economy, taking in due consideration the need of strengthening entrepreneurial skills. As a result, rethinking the training and skills development system in an integrated way would result in better matching between demand and supply.

Building upon the description and the analysis of the State of art in Extremadura with regard to workforce development, education and training programmes for developing greener skills, the following strength, weaknesses, opportunities and threats are identified.

## ***Strengths***

### *Extremadura is green*

As remarked by many stakeholders, the region of Extremadura has a considerable natural heritage and the local population is aware of this richness: among other resources, the natural parks of Monfragüe, the international Park of Tajo-Tejo, extended lands, fauna and flora. Natural resources – such as wood, the fertile land of “dehesa”, biomass, and beautiful landscapes – could become learning environments, opening up considerable opportunities for workforce development, skills updating and upgrading in bio-agriculture, renewable energy production, and eco-tourism. Moreover, traditional working processes and techniques, like those used in architecture could be rediscovered for fostering eco-building. This would offer employment opportunities to the people working in agriculture, construction and tourism, which traditionally represent major economic areas for the region, without impoverishing human capital.

### *Strong local capacity*

Green skills development in Extremadura can build upon considerable local capacity, in terms of infrastructure, training supply, successful projects, critical actors, positive experiences and spin-offs spread on the territory. The Network of 210 Employment and Local Development Agencies can contribute with skill needs analysis, information sharing, and awareness rising. They can also improve their effectiveness thanks to ICT and e-learning. Projects like EFIMEX showed that the region can offer practical solutions and answer to real problems; likewise, the Scientific and Technological Park provides the region with services and vision for greening skills, job profiles, technology, companies and the local economy. Moreover, the SEXPE’s 41 offices across the territory could be aligned with common goals and for a harmonious development of the region. Information sharing could be hosted by a web portal as a one-stop-shop for all workers and unemployed to find training and job opportunities, guidance, and also learning opportunities for ICT literacy.

## ***Weaknesses***

### *Fragmentation and lack of coordination*

The major weakness with respect to green skills development in Extremadura is the fragmentation, the lack of coordination and the multiplication of public training providers. The region has made an important bet on the optimization of resources and the adaptation of the training offer to the needs of the labour market; a bet that in case of the “green jobs” needs to be

consolidated and strengthened in order to provide the support, the training and the information needed for enterprises to develop their activities in these sectors.

### *Training for green skills is old fashion*

Training provision for green skills in Extremadura is not systematically evaluated and it therefore does not address real skills needs, often limiting the scope to information provision. More than being effective training for competences development, it seems to have low quality both in its content and in the way it is provided. The methods utilised are old fashioned. Training supply in the region should be directed towards the development of professional competences, complementing the traditional didactic methods (in-class, courses, etc.), with learning in the workplace, in the natural environment, and using new training formulas (short courses, e-learning, self-training, etc.), which are recommendable especially when it comes to rapidly changing technological fields and jobs, such as green ones. In this respect, the new training model for employment in Extremadura should continue to contribute to the consolidation of a proactive training offer adapted to the real needs of the enterprises in these sectors.

### *Lack of properly skilled trainers*

Training for green jobs in Extremadura often encounters a limit in the lack of adequately educated and skilled personnel to carry out informative and training sessions. One reason is the lack or the inadequacy of specific training programmes for trainers, especially when it comes to dynamic and technologically advanced fields like renewable energies, where knowledge and abilities are mainly learnt in company and on-the-job. In some sectors, where work experience and traditional know-how are an added value (e.g. in bio-architecture), experienced and multi-skilled workers may play the role of the trainers, even though specific session for updating and upgrading skills might be necessary.

## ***Opportunities***

### *Become a leader in Spain and in Europe for green talents*

It is important for Extremadura to exploit all opportunities for attracting, training and retaining talents, for developing human capital, taking advantage of the national Plan *Emplea Verde*. Among the others, the International Park of Tajo-Tejo, El Anillo, Extremadura Business School, the Foundation of the Scientific and Technological Park, the Energy Cluster, and the University of Extremadura, can help the region producing, innovating, developing, exporting ideas and not only goods and services. In particular, the Platform for

science and technology, promoted by the Department of Industry, Energy and Environment, could coordinate the green development of the workforce, besides linking research and technological centres (including the research centre in the park of Monfragüe), with the Institute for biodiversity on the impact of climate change and Universities.

### *Greening the school-to-work transition*

Extremadura precious tradition in VET programmes and tools for linking the school system to the labour market should be exploited for greening competences of all young people. Among the latter, the region could work on contracts and instruments like the “Escuelas Talleres”, the House for Profession, Workshop schools and Employment workshops. This could become a learning model for enhancing young people employability, using local resources and heritage, developing green awareness, acquiring knowledge and techniques for green jobs in the fields of plumbing, masonry and renewables. As a result, reinforcing and greening the school-to-work transition pathways through VET could reduce youth unemployment rate and drop-outs.

### ***Threats***

#### *Green washing*

Although the Regional Government is committed to make all jobs greener, there is a risk of “green washing” that is to say false claims of environmental virtues by companies, training providers, policy makers or NGOs, aiming at the creation of a positive image of their goods or services, which look more environmentally-friendly than they really are. This risk stems from a misunderstanding of what is environmentally green and what is just socially sustainable.

#### *The bubble of training for green jobs*

Extremadura risks creating a bubble of “green training”, useless for companies and workers and spoiling additional public resources, if skills need analysis (skills audit) is lacking, and if training remains separated from work, sticking to a traditional conception of training. Training can be one of the main levers to trigger greener development, if it acquaints learners with competences and attitudes – not just information – responding to companies’ skills needs. Otherwise, additional training would hamper the shift to green economy, or it would prove inefficient face to the cultural obstacles to green change, which exists today in companies and also in the population. The bubble of training for green jobs would not address the skills matching challenge, if training is not integrated with placement and other auxiliary services for managing the

transition, in the perspective of integration between the education and training system and the labour market.

## Recommendations

A clear set of policy recommendations could help Extremadura seizing adjustments to improve and strengthen the programmes, policies and actions in the region for greening existing skills or develop green skills locally, building on local capacity. All policy recommendations target the training system, though considering that training is no longer confined to classrooms and that also other actors are interested by this policy, namely social dialogue and labour market stakeholders.

### *Matching green skills demand and supply*

#### *Skills needs analysis (audit)*

Training should meet professional and competences' needs of companies and workers. Skills available should be systematically analysed, anticipated and forecasted. A possible model for skills forecasting builds upon the contributions of different actors spread on the territory, at different governance levels, such as could be the Local Development Agencies or the employment offices of SEXPE. The regional government then collects and coordinates all the information and make them available for workers and companies, for instance posting them on a one-stop-shop portal. The web portal of SEXPE ([www.extremaduratrabaja.es](http://www.extremaduratrabaja.es)) could host this information. In particular, a qualitative approach for expressing skill needs, in terms of competences, would facilitate defining what is “green”. By crossing qualitative and quantitative information at the local and national level (by also considering broader occupational trends given by European labour market analysis, due to the global nature of many industries in the green economy), Extremadura would have a clearer picture of training and skills needs for greening the regional economy.

#### *Actions for adult learning*

The skill matching challenge does not only interest young people, but also adult workers, who need to actively face job losses or unemployment spells, flowing from green restructuring to adjustment processes in local economies. To cope with skills matching for adult workers, Extremadura should articulate and expand training actions for adults, possibly integrating passive with active labour market policies. The existing network of employment centres or Local Development Agencies could adapt the existing services of placement and guidance, considering also the green jobs opportunities for unemployed

and job seekers. Companies, even if they are not actively running production activities due to economic slowdowns, can serve as ideal work-based learning places for those adult workers involved in training and retraining.

### *A new era for green skills development*

#### *More learning options, better articulation of training supply*

Extremadura has a solid and articulated infrastructure for training supply, which should be simplified and better coordinated, while a wider array of training options should be offered to the population of all ages in the region. The rationalization of training supply should occur through the coordination of actors, the use of different tools for different aims, and different education and training levels. In particular, “training” should not coincide anymore only with courses, disciplines, classes, or information broadcasting but it should foresee on-the-job learning opportunities, internships, vocational education and training also at higher education levels, apprenticeship contracts and in general work-based learning. Training provision for green jobs in Extremadura should shift to a competence-based approach, so that training efforts do not result in mere technical information, often linked to a specific company or a technology, but it develops awareness, language and communication abilities, e-skills and entrepreneurship, consequently making people more competent, for the rest of their life. This didactic approach can potentially turn training into the real lever for workers’ adaptation to green challenges and make investments in education and training more effective, less costly, closer to productive processes and ready to adapt to the rapid changes of green technologies. Finally, media, communication and informative systems are called for more efforts in strengthening awareness and in raising workers’ responsibility on green issues.

#### *Greening early stage education*

A major recommendation for Extremadura is fostering and enhancing the motivation and commitment of all workers in the economy to green their jobs, in terms of content and day-to-day methodologies. Besides awareness rising, information and dissemination activities, the region should green early stage education, when people shape their values, attitudes, habits and methods. Eco-buildings, waste management, energy efficiency and energy saving, eco-friendly materials, recycled papers, informative sessions on global climate change, visits to natural parks, out-door training are just some of the tools and methodologies that schools in Extremadura could put into practice. Likewise, programmes for entrepreneurial skills development should be supported. As recalled above, also the school-to-work transition is a critical stage, when young people could be given more advice and guidance, towards

greener practices, courses and VET tracks in environmental sciences, and hard sciences or career guidance for green jobs.

### *Define criteria for “green” training*

To avoid the risk of “green washing”, the regional government should define what knowledge, abilities and competences make a curriculum or a training programme greener in terms of learning outcomes. If a set of criteria is define, it would be possible to certify when a learner has developed green skills or a job profile is greener. With these certifications, the green training and green skills will be easier to identify, and could be transferred from one sector to the other. This could eventually position Extremadura as a national pool of talents for the green economy. In order to be “greener”, training supply should be carried out according to some environmentally, socially and economically friendly criteria, to be possibly shared at the regional level also with social parts.

### *Train managers in the public and private sectors*

The Extremadura Business School of the University of Extremadura could play a more active role in the regional economy by providing specific sustainable modules to its students across faculties. In order to shift towards a green economy, it is important that business managers understand the challenges ahead and know the alternatives available to make businesses in a “greener” way. The training for business managers could include awareness rising, sustainable purchasing, greening the supply chain, eco-innovation and other forms of environmentally-friendly approaches to doing businesses. This type of training should also be extended to public managers in the Government of Extremadura in order to build institutional capacities for the green economy. To achieve this, the University should enhance its own environmental practices and should consider the installation of green infrastructure in its premises.

### *Less courses, more awareness and guidance*

#### *Appropriate tools for skills development*

In order to make appropriate investments in training and skills updating, upgrading and development programmes, Extremadura should systematically use and implement tools for a better and more efficient use of skills, such as skills audit and the validation of non-formal and informal learning. These would give more visibility to those skills that are useful for greening jobs even though they are not yet recognized as such (for instance, ITC skills). Such tools would be particularly useful given the productive tissue of Extremadura, which is mainly composed by SMEs, where learning is likely to take place in non formal and informal settings. This would reinforce labour



market transparency and information as far as green skills are concerned. These tools would improve a better matching of labour supply and demand and help the search for more effective and appropriate training activities for green jobs. Moreover, training should not be disjointed from placement: existing guidance and information services should also be reinforced with mentoring and counselling, helping all workers to understand how they could green their professional profile, irrespectively of the job they perform.

### *Social dialogue: a lighthouse and critical player for greening skills*

As remarked by workers and employers' representatives of Extremadura, social dialogue could considerably contribute to turn the recent job crisis into an opportunity by exploiting the occupational potential of green jobs. Nevertheless, social dialogue in the region is required to be more proactive and engage in greening jobs, starting from greening the roles of workers and employers' representatives. Such "participatory" culture could represent the basis for establishing strong relationships, networks and partnerships with universities, VET providers and training centres. Social dialogue could help identifying, collecting and communicating skills and training needs, creating a network, based on [www.extremaduratrabajo.es](http://www.extremaduratrabajo.es). Employers and trade unions should engage in curriculum development and ensure that the skills taught correspond to those needed in the modern, greened workplace and in key sectors in Extremadura. To this end, social dialogue should be encouraged to set new standards for the new skills for all job profiles.

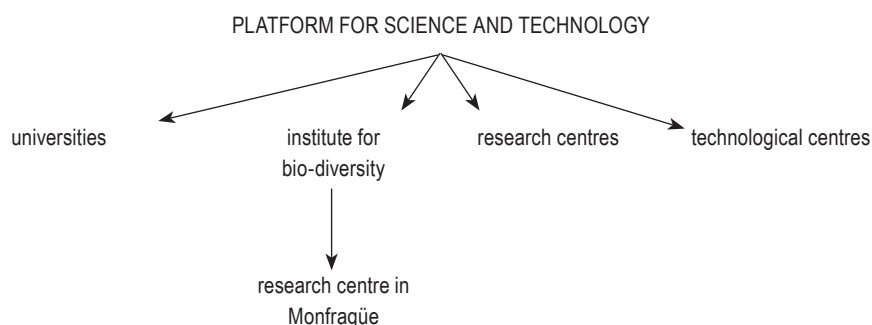
### *Building partnerships for greening the economy and human capital*

Building partnerships at the local level is a potentially successful strategy for workforce skills development and solid local capacity building. In this perspective, the Iberian Centre for Renewable Energy, which emerged as the most outstanding education and training institution for clean energy production in the region, could experiment joint research projects with the Scientific and Technological Park of Extremadura as well as joint education and training proposals. Building on their respective capacity, know-how and resources, they could also interact with the Biodiversity Foundation, an institution lying at the heart of the so called "Platform for science and technology", for re-training construction workers and enable them to access green energy jobs (see Table 11). A joint and holistic approach to skills development would allow sharing the most advanced knowledge, techniques, instruments and methods, consequently allowing Extremadura to address environmental priorities by also encountering sectoral specific needs. For instance, scientific and institutional partnerships could support the development of Biomass as a new economic sector, by taking advantage of a mix of know-how, skills and abilities in the fields of entrepreneurship, energy management, biology and agriculture. The same would hold for the adoption of homeopathic medicines to limit the damage on the soil, due



to the inappropriate use of specific techniques in agriculture. This would be the case to help farmers apply environmental friendly methods and products, as this is necessary in the case of olives production and vineyards, which have an adverse effect on biodiversity and base on intensive agriculture principles.

**Table 11. Example of partnership**



## Notes

1. UNEP, ILO, Green Jobs. Toward decent work, Genève: ILO, 2008.
2. Cristina Martinez Fernandez, Carlos Hinojosa, Gabriela Miranda, Greening Jobs and Skills. The local labour market implications of addressing climate change, Paris: OECD, 8 February 2010.
3. European Commission European Commission background paper on: The employment dimension of greening of the EU economy, Brussels, 23 November 2010..
4. See UNEP, ILO, quoted, 40. See also, M. Nikolova, Light shades of green. Climate friendly policies in times of crisis, ETUI, 2009.
5. In the European context, the importance of training for shifting to a greener labour market at all governance levels and it was widely recognized by the European institutions at the Belgian Presidency of the European Council Conclusions of the Ministerial Conference on “Promoting Green Employment”, 28-29 September 2010. Major studies, such as UNEP, ILO, 2008, quoted, remark the importance of the level of training to allow workers and companies seize the opportunities opened up by the green economy..

6. Cedefop, Skills for green jobs. European synthesis report, Luxembourg: Publications Office of the European Union, 2010.
7. ECORYS, for the Client: European Commission, DG Environment, Environment and labour force skills, Overview of the links between the skills profile of the labour force and environmental factors, Final report, Rotterdam: ECORYS, The Netherlands BV, 9 December 2009.
8. ECORYS, for the Client: European Commission, DG Environment, Programmes to promote environmental skills, Final Report, Rotterdam: ECORYS, The Netherlands BV, 30 June 2010.
9. More information at:  
*[www.imaginatuentrepreneur.com/public/documentos/1/Presentacion.pdf](http://www.imaginatuentrepreneur.com/public/documentos/1/Presentacion.pdf)*.

## *Chapter 5*

### **Enabling green growth in Extremadura**

by David Gibbs

*The main focus of this chapter is upon an analysis of the governance of the green economy in Extremadura. In particular, the need for policy coordination, policy delivery arrangements, the integration of policy across institutions, and the mechanisms to adapt the local labour market to the green economy are examined. A key question has been what are the institutional and governance barriers to enable green growth in Extremadura? In addition, to what extent does Extremadura possess the regional capability to deliver and develop a green economy?*

## Policy issues

Recent years have seen a growing awareness that green industries and technologies offer considerable economic development potential. As opposed to previous attitudes, which often saw environmental protection as antithetical to economic growth, policy makers around the world now see the green economy as a source of growth and jobs and the basis of a new round of capital accumulation (HM Government, 2008). However, it is increasingly recognised that the complex and multi-sectoral nature of the green economy requires a coordinated response by governments in partnership with other regional actors. As Hamdouch and Depret (2010: 475) state: “countries where the green economy is currently the most developed are generally those where the public authorities (national or regional) adopt an active and dynamic approach to the long-term co-integration of environment policies and innovation policies, with the support of a global coalition of private stakeholders and institutions”. A multi-level and multi-governance approach towards the integration of policy is therefore required to encourage the green economy to develop.

There are a number of levers that local and regional government can use to help ensure the green economy begins to develop and expand. This can be both “by stimulating demand and improving the capacity of the public sector, business and individuals to respond” (LGA, 2009: 18). More specifically, local and regional governments can:

- Promote energy planning and the reduction of carbon emissions in economic regeneration programmes;
- Exercise a powerful leadership and demonstration effect by developing and shaping their own services, buildings and facilities;
- Shape innovation and markets through procurement and influence over supply chains;
- Work with employers and employment and skills providers to ensure skills gaps are identified and new training opportunities provided;
- Identify and support innovation.

Long term policy planning is a key factor, but needs to be both pro-active and focused on a small number of strategic niches. In the latter case, government institutions need to work closely with other local actors to drive the emergence and development of new green sectors. The governance of this policy integration approach necessitates a rethink of traditional economic development policies as the green economy reconfigures established organisational boundaries. Governance moves from the level of individual actors “towards more socialised and systematic forms of collective co-ordination in networks. Coalitions, lobbies, public-private partnerships and social networks thus play a key role in the

development of environmental innovations” (Hamdouch and Depret, 2010: 483). Developing the green economy will therefore involve new ways of working, especially across existing institutional structures, and will necessitate breaking down the “silo mentality” that may exist within government departments. If prioritised, the green economy should become a central focus for all sectors of government, rather than being seen as the preserve of specialists and individuals.

## Analysis of Extremadura

Extremadura’s economy is dominated by the service sector, especially tourism. Agriculture remains important and although it accounts for a limited percentage of the regional workforce (9.8%), this is still a high level compared to the Spanish national average. During the study visit, respondents indicated that there are few opportunities to create employment through traditional agriculture, although there is potential to add value to existing products and to develop organic and/or regionally-distinct food products. The latter could also be related to the opportunities within the region to expand and develop international tourism. The region is dominated by large numbers of small companies (only 1% of companies have more than fifty employees) and has high levels of unemployment compared to the national average, with women accounting for a large proportion of this.

Respondents during the study visit argued that the key elements in developing the green economy are network, talent and money (“tejido, talento and tesorería”). In relation to constructing a web, or networking (“tejido”), this relates directly to local institutional capacity for developing the green economy and, as outlined throughout this chapter, is a major shortcoming within the region. An important problem identified by interviewees during the study visit was attracting and retaining talent (“talento”), especially in a region with a long history of exporting people to other parts of Spain and beyond. Long term emigration of population has left fewer young people than the national average. There are opportunities here to build links with those outside the region, for example by developing the alumni network of the University. Local policymakers also need to think about making greater use of the diaspora and to develop connections with those who have left the region, who could either be induced to move back, or to offer financial and promotional support for the Junta’s activities. Extremadura may have some advantage here in the quality of life it can offer, which some academic commentators have identified as important for attracting creative workers (see Florida, 2002). However, lower salaries than those available in other Spanish regions may limit the success of such a policy. There was little evidence presented that lack of availability of funding (“tesorería”) is a major problem for entrepreneurial activity – indeed, respondents provided evidence of a business angel network for private equity to support business creation.

There is general agreement, both from the earlier survey material and from the study visit, that Extremadura possesses considerable potential opportunity to develop a green economy due to its strengths in natural resources, green energy and green tourism. Renewable energy would seem to be of key importance – indeed, as stated in Chapter 3, already 52% of the region's energy is derived from this source. There is a high potential for the development of solar energy capacity in Extremadura, with targets for the period 2004-10 to increase solar thermal energy (from 3 310m<sup>2</sup> to 170 055 m<sup>2</sup>) and solar photovoltaic energy installations (from 0.54MW to 13.39MW) along with associated job creation (GHK, 2009). Opportunities in biomass development for energy generation were also identified as important by several of the respondents during the study visit. The potential of biomass has already been developed in Chapter 3 of this report. Renewable energy could thus become a major focus for green development in the region, especially with the establishment of the Iberian Centre of Renewable Energy and Energy Efficiency at Badajoz. There would appear to be opportunities to export solar energy products in the future, especially large solar plants. Export markets in parts of West Africa, especially the Portuguese speaking areas, and Brazil are seen as potentially good markets.

However, while there are considerable opportunities in the region, there is a need for much greater integration of activities and coordination. This is also a problem at the national level – thus there is a reported lack of strategic coordination of skills responses for greening the economy at different administrative levels in Spain and a lack of policy integration between different environmental policies and skills development strategies. There are some examples of how this has been addressed in Spain – see for instance the Proyecto Sol outlined in GHK (2009). However, as at the national scale, there is a need for much greater coordination within Extremadura in order to develop a proactive approach to linking economic, environmental, labour market, R&D and educational strategies through a well-defined regional green strategy.

There is currently a large network of public and private institutions in Extremadura involved in both employment and local development activities and climate change, as outlined in Chapter 1. However, these do not seem to be coordinated, nor, in some cases, to be aware of each others' activities. Similarly there is a considerable amount of activity on the ground related to nature tourism, interpretation and education, but again these do not appear to be coordinated in any strategic fashion. There needs to be much better coordination and networking between the institutions involved and to develop a regional green strategy that is integrated across them and with other local actors, especially the private sector. Some of the institutions obviously have well developed links with local companies. For example, from evidence provided during an interview with a FUNDECYT representative, it was argued

that the organisation is fully cognisant of the needs of local companies or has strategies to reach those that cannot be visited personally. Despite this, it was often not clear how individual projects are linked to training and skills development and there is little integration between project development and the skills/jobs agenda.

One positive development is the recent Social and Political Pact of Reform signed by government and unions to work together. This Pact includes the green economy as one of four emerging sectors to be developed (the other three are tourism, proximity services and ICT), together with four traditional sectors with the potential for transformation into greener sectors (agriculture, food, retailing and eco-building) and may indicate evidence of incipient institutional capacity building. There is also some evidence of existing inter-institutional working which may provide a starting point for closer cooperative working *e.g.* the Department of Agriculture and Rural Development working with the Regional Ministry of Equality and Employment in developing training plans and for international cooperation *e.g.* for agricultural students from Africa.

However, the study visit also revealed several examples of lack of knowledge of each others' activities across institutions. To emphasise this point, the institutional questionnaire also revealed that many of the local institutions<sup>29</sup> have neither the capacity or trained personnel to advise firms on greening and green skills/training. The same institutions in turn indicated that they find it difficult to define demand for advice. At the same time, few believe that they offer services that meet the growing "green demands" of their users, yet those providing such services see that they need to increase their capacity to do so.

It is notable from the questionnaires that few firms have undertaken training related to the green economy. Where training has occurred it would seem to be in anticipation of (unspecified) future needs. A major barrier for those firms that have not undertaken training (20% of firms) would seem to be the absence of information. These responses may help to explain why firms find it difficult to access information and points to a need to "train the trainers". Few of the institutions say they have changed internally in response to climate change and most would appear to have reactive stances towards environmental issues, so again there are substantial deficiencies in "green institutional capacity" locally that need to be addressed. This may limit the ability of regional institutions to be pro-active in the green agenda and to act strategically in the identification of skills needs in companies before skills gaps appear.

Overall, there is an urgent need to develop institutional capacity and environmental governance through connecting up and networking institutions in order to help manage the transition to a green economy. There is a substantial amount of green economy-related activity underway in Extremadura, but currently these are largely piecemeal and with no clear

message. Regional actors need to develop and communicate a clear message about “Green Extremadura” to regional, national and international audiences and to link the initiatives on green jobs, renewable energy, tourism and organic food into a more coherent package.

Some private sector respondents to the questionnaire survey mentioned that the number of training actions on offer confused entrepreneurs. This was echoed in criticism from business respondents during the study visit that the advice and assistance on offer is not well coordinated and is overlapping. This indicates a need for much better signposting, perhaps through a “one-stop-shop” or portal approach as suggested in Chapter 4. Evidence gathered during the study visit showed that there is a lack of capacity within the regional administration to provide high quality services and orientation to the private sector about green economy developments. One potential solution is for a specific post (or posts) working across the different administrative offices to provide a better assessment of the labour market situation and to provide advice to the private sector and entrepreneurs.

The study visit did, however, provide a number of positive developments within the region. The Scientific and Technological Park (STP) of Extremadura is an example of attempts to shift the region away from an agro-industrial base towards more competitive and innovative sectors. The Park is trying to attract technology-based enterprises both through inward investment and fostering the creation of new businesses. The Park claims to be attracting firms linked to green energy and it was argued that the region has a comparative advantage in this field linked to developments in nuclear power, hydro-power and solar energy.

Two specific STP programmes are linked to the green economy agenda: first the ICENER programme<sup>30</sup> to train and educate people from the building trades for the green energy sector – this was said to have been successful and has been aimed at both companies and individuals. Through ICENER, the STP provides training and entrepreneurship services in green energy sectors. Second, there is a programme to stimulate new enterprises in the value chain of green energy<sup>31</sup>. This chain includes: technologies; products; technical services; financing; and support services. This should be able to build upon existing success – thus for all sectors (including non-green energy projects), the spin-off rate for new enterprises from the University of Extremadura is four per annum, which is double the average for Spanish universities<sup>32</sup>. The ICENER programme project plans to create ten renewable energy enterprises and ten R&D projects in the period 2007-13. Of importance here are attempts to reorient existing firms into new green sectors, creating new firms and building links between these and university research groups. The Park has created guides for potential entrepreneurs wishing to establish companies in green sectors.



The park's role is also to act as an interface between business people and universities, with a mission to generate new joint projects – some evidence was provided by respondents of a successful response to a recent national call for projects which had involved five enterprises and two university research groups within the region developing a commercial activity. The park and its staff thus have potentially important roles to act as regional *animateurs*. The park's activities also appeared to be one of the few examples of collaboration with the University of Extremadura which has so far been limited within the region; the University is willing to collaborate, but not very pro-active. The Park needs to develop a clear link with the newly established Iberian Centre of Renewable Energy and Energy Efficiency to develop a critical mass. This would help to build capacity in R&D+I, not just in relation to energy generation, but also linked to more efficient ways of capturing solar energy and selling Extremadura's expertise abroad *e.g.* developing the existing links with Israeli companies for solar energy and irrigation.

The Park has obvious links to the energy cluster in Extremadura. The regional Ministry of Economics, Commerce and Innovation have developed a system to encourage innovation and R&D through cluster development – fourteen have been established in total. These are said to operate more as business associations than as clusters, but are perceived as a productive institutional innovation to help connect business, education and research within the region. Indeed, the energy cluster in Extremadura has recently been certified as excellent by the Spanish Ministry of Industry, Tourism and Trade. Networking has been facilitated by individuals employed specifically to do this and the cluster representatives mentioned inter-firm cooperation and inter-linkage aimed at encouraging innovation as a key aim. There is a potential role for the energy cluster by linking into other sectors (perhaps best achieved by working with the clusters in other sectors) and acting as a champion for energy efficiency across the region. In this regard, there is a need for more active leadership from regional government in order to stimulate energy efficiency across the region and in local companies. There may be opportunities to develop the R&D+I in this particular sector and to sell consultancy services through existing links with the Middle East, South America and Scandinavia. Regional government needs to see the energy cluster as a long term development and invest accordingly – although it is worth noting that this may be problematic given the impacts of the credit crunch and reduced government spending at national level. In addition, alterations to Spain's feed-in tariff for new solar thermal installations may also discourage investment<sup>33</sup>.

As stated in previous chapters, traditional building techniques also offer opportunities for employment and new jobs in the greener economy. Moreover, interviewees argued that traditional techniques were often greener than more conventional building techniques. The region could derive export opportunities through encouraging and supporting these traditional methods.

Architect interviewees during the study visit had identified demand for these methods in overseas markets – for example, some had been invited to lecture on their ideas in the USA, in New York and Boston, and in Central America. Extremadura therefore has the resources to develop training in these techniques, but needs to develop the institutional framework to allow this to happen. Regional government does not seem to understand the potential value of traditional techniques. There is a need for institutional flexibility to allow a new building code to incorporate traditional building techniques and for this to support those techniques which are both energy efficient and labour intensive. While the current code is good for energy consumption reduction, it does not consider the use of traditional building techniques such as the use of rammed earth or the use of cork for insulation. Hence standard architects cannot incorporate these materials because they are not included in the code.

## Challenges and opportunities

### *Strengths*

#### *Building on past experience*

The region has past experience in organising green skills training through the renewable energy training programme by the Extremadura Public Employment Service (SEXPE) and this provides a basis of existing institutional good practice on which to build a skills and training policy at the regional scale (GHK, 209: 23). This programme was funded by the regional employment body SEXPE and delivered by a public regional enterprise – FONAMA (Fomento de la Naturaleza y el Medio Ambiente), but in collaboration with the private sector for course design and performance – and is cited as a good example of a public-private partnership for skills training. This may provide the opportunity to create a permanent training centre (as recommended in GHK, 2009) to improve the skills response. However, FONAMA respondents were more sceptical about the need for only one centre, given the size of the region, and proposed that a series of micro-centres for training would be more appropriate. There is also the experience of the EFIMEX project to draw upon, which provided training in sustainability, mainly for the agro-food sector.

#### *Building on existing potential resources*

The main strength lies in the regions potential for green/renewable energy, plus strengths in natural resources, green tourism and food production. All of these offer opportunities for the transition to a green economy in Extremadura.

### *Social dialogue and democratic participation*

While a lack of institutional capacity around the green economy has been identified, the recent signature of the Social and Political Pact of Reform by government and unions indicates a willingness to work together. The various economic and social actors are thus well aware of, and involved in, the definition of the political and economic agendas for the region. This incipient capacity building effort should help the regional authorities to gain consensus and gather evidence to support its decisions. Thus in some areas, Extremadura does have strong collaborative arrangements in the region to build upon.

### *Weaknesses*

#### *Lack of coordination*

Despite the FONAMA example outlined under Strengths, there was evidence of a lack of coordination between public sector bodies, the workforce and the private sector to anticipate skills gaps – indicating a need for a strategic response. There appears to be poor coordination of public sector agencies, with numerous overlapping projects in some areas and a lack of strategic direction in other areas. There is a lack of policy integration between different environmental policies, employment policies and skills development strategies and in the whole area of renewable energy policies, where there is a need for much greater integration of activities and coordination. During the study visit a lack of commitment by public sector agencies to the sustainability agenda was identified, as well as frequent changes to strategic direction (long term) and support which have discouraged commitment by other actors (*i.e.* changes to subsidies for renewable energy has hampered investment in the sector). There is also a concern about the lack of enforcement of environmental legislation.

#### *Lack of institutional capacity*

A major shortcoming within the region is a lack of local institutional capacity for developing the green economy. Many of the local institutions (local development agencies, training centres, employment offices, etc) have neither the capacity nor the trained personnel to advise firms on green opportunities and green skills/training available. The same institutions indicated during the study visit and the survey that they find it difficult to define the businesses needs, and believe that they do not offer services that meet the growing “green demands” of the businesses. Overall, public institutions do not seem to have the capacity to respond effectively to the new demands of the businesses and provide quality advice to promote the green economy. This is a theme that emerges throughout this chapter and which addressing this forms the basis of several of the recommendations.

### *Difficulty in identifying skills needs*

One structural weakness is that the dominance of the regional economy by SMEs means that most firms cannot afford to undertake internal identification of skills needs, “SMEs usually communicate skills gaps to regional bodies, training centres or corporate associations” (GHK, 2009: 36). SME owners and managers may also not have the time to attend courses. For example, the EFIMEX programme shifted from a block training programme to e-learning to accommodate the time demands of SMEs. It is important that there is coordination between social partners, private training centres and the public sector to identify skills needs (skill audit) and to provide SMEs with the training they need.

### *Limited awareness of market opportunities*

SMEs in Extremadura do not currently see the environment as a priority (or more importantly as a market opportunity) given other more pressing day-to-day priorities. While this is not a surprising result, and one that is not confined to Spanish SMEs (see Department for Business Innovation and Skills, 2009 for similar evidence from the UK), it does indicate that there is a substantial amount of work to be done to obtain active engagement with the green economy agenda by mainly entrepreneurs in Extremadura and to make them aware of the business opportunities involved.

### *Limited innovative activity*

Despite some efforts identified to shift the region away from an agro-industrial base towards more competitive and innovative sectors, there is a lack of innovative activity that hinders this transition. The clusters are perceived as a productive institutional innovation to help connect business, education and research within the region, but the outcomes have been very limited. Also, the University’s contribution to the innovation activity in the region is extremely weak. There are limited collaborations between the University, other public sector partners, and industry which hinder the expansion of added-value sectors and the innovative regional capacity. Inter-firm cooperation and inter-linkage aimed at encouraging innovation should be fostered not only within the clusters but across the various sectors of potential expansion in Extremadura (e.g. eco-tourism, eco-construction, waste management, biomass, etc).

### *Lack of green entrepreneurship*

There was little evidence of firms involved in programmes such as EFIMEX or others, subsequently engaging in the development of new ideas and innovations. This is despite the fact that the EFIMEX programme was designed to raise companies' environmental awareness and provided in-depth analyses of their methods and practices. There remains a need for green sector entrepreneurial skills development, support and training, albeit that this is being provided through the Scientific and Technological Park specifically for renewable energy businesses. More efforts are needed to create a culture of entrepreneurship and innovation in the region to foster business activities based on close collaboration with social partners such as University of Extremadura.

### *Poor transport links*

Current poor transport communications could inhibit any attempts to develop Extremadura as an international tourist destination. Thus links by air are either through Portugal or Badajoz airport – the latter is poorly served by direct links to the rest of Europe, involving connections through Madrid, Bilbao or Barcelona. There are currently no low-cost airline links from Badajoz to elsewhere in Europe which have played an important role in opening up other European locations for tourism. Rail travel to Madrid from Badajoz currently takes around five and half hours, although a high speed link is planned for introduction in 2012 (this may be delayed due to the financial crisis) which would open up Extremadura to Europe's high speed rail networks. Access via this rail link could help reinforce the region's green credentials to those eco-tourists who may avoid air travel.

## ***Opportunities***

### *Learning from other regions*

A programme of visits and interchanges of experience with other Spanish regions would be productive and develop longer term institutional links at regional government level. This could help create synergies to assist with knowledge sharing and dissemination of good practice within Spain. The possibility of doing this was identified by interviewees from FONAMA as something that was planned for the future, but there would appear to be opportunities to establish better networking amongst similar public companies across the Spanish regions.

### *Green tourism opportunities*

Extremadura has many natural assets that could be better exploited with a sustainable approach. The development of green tourism provides an opportunity with the advantages given by Monfragüe National Park, Cornalvo Nature Park and the International Tagus Natural Park. International tourists do currently come to Extremadura, but mainly on a self-organised basis. Tourism has already been identified as a key sector for the region and there are a number of initiatives underway. The importance of a “landscape heritage of quality” and the “dehesa” was mentioned by several respondents as a factor with a high potential as a basis to attract tourists and in the process to develop new markets.

### *Eco-tourism*

There would appear to be an opportunity here to link to a much greater focus on eco-tourism development and the related provision of support for small scale developments in the form of education around eco-tourism for managers. Some workshops have been organised by the Ministry of Industry, Energy and Environment to raise entrepreneurs’ awareness of the environmental wealth and biodiversity found in Extremadura and these should be further utilised to develop and promote local tourism businesses. Other planned courses have been developed from the Green Jobs training programme including courses on receptionist training and catering in the area of rural and natural spaces tourism, indicating the need for skills development across the whole range of the workforce and not just at managerial level. As mentioned in Chapter 3, non-specialist jobs with updated skills – such as housekeepers, waiters and cleaners – can produce new job opportunities in the service sector within the green economy.

### *New export markets*

There is potential to develop new export markets for renewable technologies in Latin American countries. There are considerable opportunities for the energy cluster to cooperate with, and export to, North Africa, related to the Mediterranean Solar Plan, and South American countries such as Brazil, Chile and Venezuela. There is also some potential to develop export markets in crop irrigation techniques where existing links have been forged with companies in Israel. Finally, the region could derive export opportunities through encouraging and supporting traditional building methods. Architect interviewees during the study visit had identified demand for these methods in overseas markets – for example, some had received invitations to teach their ideas in the USA, in New York and Boston, and in Central America.

### *Local and organic food*

Currently, several organic products are being produced in Extremadura, but these are being taken outside the region (e.g. to Andalucía) and packaged and sold there. Extremadura has an important production of high quality food products that can be processed, “branded” and exported to both the rest of Spain and overseas. Indeed, agriculture and food production are important within the region, with much existing agro-food production of rice, tobacco, paprika and tomatoes, but little or no value being added to these products locally. The extension of the land and the know-how of the population offer a great opportunity for Extremadura to compete in the food market. There is scope to develop strategies based around local food production and marketed on a “green”/organic premium. Several food items are already certified within Extremadura (e.g. cheese, honey, paprika, ham etc.) on the basis of “Natura Extremadura” brand<sup>34</sup> and the Junta already supports an *Alimentos de Extremadura* brand to promote regional food products and the *Organics Extremadura* brand.

### *Outdoor sports*

The development of the outdoor sports centre – the International Centre for Innovation in Outdoor Sports, El Anillo – provides an opportunity as a location for research and company formation. The centre also has a potential national role as a focus for outdoor sports training. The Centre may also be useful as a promotional tool for quality of life for creative workers. As Florida (2002) has shown, creative knowledge workers are often attracted to particular locations where there are opportunities for outdoor recreational activities.

### *Green procurement*

There are also considerable opportunities regionally for green procurement. With the right processes in place, regional government can actively support the development of local businesses in the green economy and encourage innovation. For example, one possibility is to use this to encourage traditional building methods for new building projects and for refurbishment. In the UK, guidance has been issued on how to embed skills and training into public procurement as part of a plan to work with public sector clients and suppliers in different sectors (see DIUS/OGC, 2009), recognising that governments can play a role in facilitating the development of markets for green products and services and to create more certainty for investment in skills training. There are opportunities here for regional government in Extremadura to lead by example in delivering green economy objectives. Some training may be needed for procurement professionals in the region and there are opportunities here to learn from the experience of regions in other countries.<sup>35</sup> The learning model section on Green Purchasing Policy gives some examples of how this has been addressed elsewhere.



### *Developing the Ecoparks*

There may be opportunities for the further development of the existing ecoparks. These are currently based around solid urban waste management, but could offer the potential to handle other forms of waste treatment and recovery and offer opportunities as the basis for some form of eco-industrial development. There might be scope regionally to develop an industrial symbiosis<sup>36</sup> project – *i.e.* where waste and energy flows are seen as inputs for other sectors rather than as something for disposal. Such an initiative could provide opportunities for skills training, as well as managerial development *e.g.* through workshops to identify potential interchanges of local firms' wastes. An eco-industrial development might also have potential linked to energy generation from biomass. This could link to some of the existing biomass initiatives for energy where agricultural waste (*e.g.* from tomatoes, olive cuttings) forms an input for energy or biodiesel production. This could help to expand the employment opportunities from biomass project developments.

### *Linking cluster activities*

There is a potential leading role for the Energy Cluster by linking into other sectors (perhaps best achieved by working with the clusters in other sectors) and acting as a champion for energy efficiency across the region and Spain. Maximising the potential of the Energy Cluster could lead not only to strengthening the position of Extremadura as a leader in the energy sector, but also to stimulate enterprise creation and jobs. Indeed, previous OECD work demonstrates that clusters contribute to the dynamic for enterprise creation, notably by stimulating the creation of spin-outs in core cluster sectors, but also by the creation of economic activity through increased demand for indirect services (*i.e.* induced activities). Styria in Austria has a well developed network of firms recycling wastes and resources (Wallner, 1999), which together with cluster activities in the field of energy and environmental engineering constitutes Eco World Styria (a networking organisation owned by the Provincial Government, the City of Graz and Styrian Economic Support). In 2010, Eco World Styria was recognised as the world's best Green Tech cluster by the US Clean Tech Group (see [www.eco.at](http://www.eco.at)).

### *Threats*

#### *Restrictive building codes*

The current Technical Building Code appears to encourage the installation of certain kinds of green technologies (*e.g.* solar energy), but inhibits the use of existing traditional building techniques. These may therefore be disadvantaged or positively discouraged as an unintended consequence of current



policy choices. The use of traditional techniques and materials could potentially be linked with the Department of Agriculture and Rural Development's Institute of Cork, Wood and Natural Coal and to promote the use of cork as a building material. This might also help to replace the loss of traditional markets for cork *e.g.* wine corks which account for 60 per cent of production.

### *Competition from other regions*

Competition from other Spanish regions for the same types of green economic activities, especially those based around renewable energy, where other regions may be more developed in institutional capacity terms to support this development (*e.g.* Navarre, Basque Country) is a threat to Extremadura's green strategy. There is also competition for the types of green tourism that is on offer in Extremadura, both within Spain and elsewhere in Europe.

### *Lack of network capacity*

The development of energy generation plans for the renewable sectors needs to ensure that network capacity is adequate to deal with this. Currently, it seems that the network does not have the capacity to meet the needs of the plans.

### *Continued population loss*

Extremadura could continue to experience a loss of population to other areas within Spain and overseas if job opportunities are not created locally. Given that these are likely to be the younger and more dynamic components of the population, this may reduce the kinds of innovative and entrepreneurial talent available.

### *Uncertain future of EU funding*

The withdrawal of EU funding from the region and from Spain and allocation to the accession member states gives a limited window of opportunity for restructuring towards the green economy in Extremadura.

## Recommendations

### *Strengthen the institutional capacity*

#### *Develop a strategic public-private partnership*

There is a need to develop a strategic partnership for Extremadura for a green economy strategy bringing together different parts of the public sector with the private sector, business, unions, community and voluntary sectors, so that different initiatives and services support each other and work together. Public-private partnerships are essential for moving an agenda forward towards a common goal. The strategic partnership should produce a strategy that has a long term vision for the economic, environmental and social development of the region, and sets the context for the regional authority and its partners to have the capacity to deliver the green economy and the associated jobs and skills. The partnership needs to play a role in identifying regional market challenges and opportunities which will include fostering innovative activities and identifying skills demands. It could also play a key role in prioritising the actions and concentrate efforts accordingly. The learning model from the East of England region in the UK (see annex) provides a good example of how this can be developed.

#### *Create posts for networking environmental managers*

There is a need for much greater networking and joined-up thinking to create better institutional capacity within Extremadura, with a particular need for the coordination of actors and networks. One policy response would be to train the local agents and orientators and/or to foster much greater linking/networking to environmental experts, the Energy Cluster of Extremadura and the STP schemes, so they can make informed connections. Another potential solution is for a specific post (or posts) of “sustainable advisors” working across the different administrative offices to provide a better assessment of the labour market situation and to provide advice to the private sector and entrepreneurs on the green opportunities<sup>37</sup>. These “sustainable advisors” can also advise the public institutions on how to make greener processes and methods within the public sector (for instance, green procurement). The recommendation is therefore to employ individuals who can work across and connect up regional institutions and actors, thus developing institutional capacity around the green economy. In the East of England (see learning model) these individuals have the title of Environmental Sustainability Theme Manager, and play a vital role in ensuring the successful implementation of the competitiveness programme. Indeed, evaluation of EU programmes in other regions across the European Union concludes that the appointment of such individuals is single most effective activity in delivering

environmental integration. In addition, existing local agents and orientators should receive environmental training and/or be encouraged to foster much greater linking/networking to environmental experts and the energy cluster of Extremadura, so they can make informed connections.

### ***Pull the demand of green products and services***

#### *Lead by example, systematise green procurement*

The Junta de Extremadura should provide strong leadership for the region in its ambitions to develop the green economy and take every opportunity to use its own activities and services to demonstrate its own commitment to the green agenda and to provide an example for other partners within the region. One practical way to lead by example is through the development of a policy of green public procurement. This could help stimulate demand for a variety of local products and services (e.g. renewable energy, organic food) and encourage innovation and shape markets for local firms. One possibility would be to use this to encourage (through legislation) the use of traditional building methods for new building projects as well as for refurbishment of public buildings. Also, there are opportunities here for regional government in Extremadura to lead by example in delivering green economy objectives through green procurement. To illustrate this approach, details of the process of green public procurement policies and that have taken place in London are provided in Annex A. The ICLEI website<sup>38</sup> also contains much useful information and resources from other European examples (Barcelona is the only example mentioned that is located in Spain, so there are opportunities here to be a national leader). In addition, there is a need for more active leadership and long term commitment from regional government in order to stimulate energy efficiency across the region and in local companies.

#### *Consider developing an industrial symbiosis project*

It is certainly worth exploring further opportunities for waste management (see Chapter 3) as well as industrial symbiosis. Industrial symbiosis projects are those where waste and energy flows are seen as inputs for other sectors rather than as something for disposal (see Gibbs and Deutz, 2007 for an overview). The classic example of industrial symbiosis is at Kalundborg in the Sjaelland province of Denmark ([www.symbiosis.dk](http://www.symbiosis.dk)) where there is a Centre for Symbiosis to provide advice. The UK's National Industrial Symbiosis Programme ([www.nisp.org.uk](http://www.nisp.org.uk)) is a national programme, but organised on a regional basis with semi-autonomous teams in each region and would be a good source of advice and further information.

### *Maximise the potential of your competitive advantage*

#### *Review your brand and focus your labels*

At present there are a number of green economy activities that are uncoordinated and which need presenting as a coherent whole with a strong message and slogan – “Green Extremadura” for example. This slogan needs to have certain measurable standards so that the message is clear to what it actually means and avoid “green washing” as discussed in Chapter 4. The “Green Extremadura” brand should be one that represents the competitive advantages of the region, sets measurable standards, and stimulates the transition to a green economy in the public and private sectors.

#### *Make the most out of “El Anillo”*

On the one hand, “El Anillo” will be useful for building capacity for outdoor sports companies locally and should be linked to tourism development where there is a growing interest in active holidays and in the “experience economy”. In the UK, for example, activity holidays outperformed the overall travel market up until the recent financial crisis, with a volume growth of 17.2% between 2003 and 2007 (see [oxygen.mintel.com](http://oxygen.mintel.com)). It is notable that such holidays are becoming more mainstream, with greater participation by women, the over-50s and families. On the other hand, “El Anillo” could also make a better use of its infrastructure if it joined up with the University and the Scientific and Technological Park to become a centre of excellence for research and development in sports. Indeed, some initiatives are in place in “El Anillo” related to health, mobility, and therapeutics that could have a greater visibility at national and international level if “El Anillo” was positioned as a centre with R&D capacities. This would be quite unique.

#### *Make a better use the “Hospederias” brand*

Green tourism development needs greater coordination across initiatives. Indeed, the “Hospederias” brand could facilitate the coordination of the tourist offer by, for example, cross promoting nature and cultural tourism. But also, there should be specific plans for the positioning and development of “Hospederias” by the regional government. The “Hospederias” brand should embed the sustainable component in its standards in order to become the reference in eco-tourism. This could become the real distinctive feature of this brand as compared to the national “Paradores” and other similar brands elsewhere. Also, the Hospederias should be promoted not only as places to stay for potential tourists, but also to link development with staff training in eco-tourism or sustainable practices so that staff are able to provide quality advice and information to tourists.

## ***Build on existing strengths and clusters***

### *Link up the Energy Cluster to develop critical mass*

The Energy Cluster is currently the most advanced of these with considerable activity focused around the cluster, the Scientific and Technology Park and the Iberian Centre of Renewable Energy and Energy Efficiency. However, these appear to be operating in isolation with little awareness of related activities within the region. The Park needs to develop a clear link with the newly established Iberian Centre of Renewable Energy and Energy Efficiency to develop a critical mass. This would help to build capacity in R&D+I, not just in relation to energy generation, but also linked to more efficient ways of capturing solar energy and selling Extremadura's expertise abroad e.g. developing the existing links with Israeli companies for solar energy and irrigation. The learning model example from the East of England (see Annex A) indicates how one region has utilised strengths in renewable energy to establish a centre which acts as a repository of information and knowledge, a focus for the offshore wind sector's regional development and as a concrete location for company start-ups and subsequent expansion. The STP and/or Iberian Centre of Renewable Energy and Energy Efficiency should play a similar role within Extremadura.

### *Support the traditional building sector*

Traditional building methods should be encouraged and supported not only for the importance to refurbish housing in Extremadura in a more sustainable manner, but also for the potential export opportunities in this sector. The region has an excellent pool of qualified architects and workers that have the knowledge and skills to use traditional building methods. As skilled workers in the building sector return to Extremadura due to the economic crisis in major cities, there is an opportunity to train them with traditional building methods that are more environmentally-friendly, more energy efficient and more labour intensive. Moreover, it is a sector with potential to expand as demand for these methods has been identified in overseas markets by architect interviewees during the study visit, with potential connections to build upon in the USA and in Central America.

### *Develop eco-tourism activities*

Tourism is already an important sector in Extremadura. There are opportunities to develop an international market for eco-tourist activities, especially on a more organised basis. The latter could even turn into value added activities for agricultural diversification and farm-based tourism (see Bryden et al (2010) for details of nature-based tourism in Scotland). It is important to

consider that any developments to grow tourism should occur not just in the nature reserves, but also in the municipalities around the parks. A more strategic framework to support tourism development should therefore take into consideration the conservation of the natural landscape, but also the infrastructure and other intangible assets (quality service, good food, cultural offer) that will attract tourists to a more organised destination. However, these initiatives need to be linked in with training and skills development. REDEX agency's development of "tourist experiences" should contribute to this.

### *Balance eco-tourism development and conservation*

The development of eco-tourist facilities needs to take care to avoid adverse impacts on habitats and nature. There is a need to develop interpretation centres and to direct visitors to particular places. There is an overall need for an improved infrastructure for eco/nature tourism and training in order to preserve the natural resources as well as the cultural heritage of Extremadura.

### *Better organise the traditional sectors*

#### *Support added-value activities related to the environment*

Extremadura benefits from several natural conservation/wildlife initiatives, especially in relation to bird watching. Some of these initiatives offer opportunities for greater inter-institutional working and to bring innovative ideas into the region. For instance, the new research centre in Monfragüe focused on biology and climate change offers an opportunity to build on university and research links and potentially offers a model for other centres based around local competencies and strengths.

#### *Support the production, process and export of organic food*

There appears to be considerable opportunity to develop further regional and organic food within the region through cluster development and to contribute towards greater value added being retained within the region. Indeed, there is a need to add value to food products and to process foods within the region and not to export these elsewhere as bulk commodities – building on the work of the Department of Agriculture and Rural Development. The CREEX website ([www.creex.es](http://www.creex.es)) has details of a product support plan for organic food products, but there is a need for a strategic plan for organic products and their promotion both within Spain and in international markets. The learning model example from Lower Austria indicates how such cluster policies have been developed through the activities of a government-owned agency and, for both the cases of food and eco-buildings, offers some guidelines on how this has been achieved elsewhere.

### *Link up food-related policies with local eco-tourist initiatives*

Food-related policies should be tied into both local eco-tourist initiatives and international marketing (there are several examples of this from Italy, for example, where regional development agencies have taken this approach like the Ente Regionale di Sviluppo Agricolo in Campania (ERSAC)). There are currently some plans along these lines for the Tajo/Tejo park e.g. for ham and cheese produced in the park and for marketing these products at international trade fairs. The “Natura Extremadura” brand, which denominates a product produced in protected areas, could potentially be a candidate for PGO/PGI EU certification and this needs further investigation.

### *Building links outside the region*

#### *Create networks in the energy sector*

There are opportunities to exchange and learn from other regions’ experiences in energy-related activities. Within Spain, Extremadura may want to link up with Navarra to exchange knowledge in renewable energies (II Environmental Training Plan, 2010-13) and with the Basque Country to learn from each other on approaches to vocational training for energy efficiency and solar thermal energy. In addition to developing such links with Spanish regions, policy makers in Extremadura may also look outside Spain for relevant experiences in developing the green economy and engage in wider networking activities (see the learning model sections for examples related to this point).

#### *Make a greater use of the diaspora*

Extremadura has been a region producing human capital but has not been able to retain it. There are opportunities here to build links with those outside the region that have previously lived, worked or studied in Extremadura, for example by developing the alumni network of the University. Local policy-makers also need to consider about making greater use of the diaspora and to develop connections with those who have left the region, who could either be induced to move back, or to offer financial and promotional support for the Junta’s activities.

## Notes

1. Note, however, that virtually all respondents were engaged in employment and labour market services rather than in the environmental domain.
2. Innovación para la Creación de Empleo Sostenible en el Sector de las Energías Renovables en Extremadura.
3. See the *Guía de Creación de Empresas en los Sectores Energético y Medioambiental*.
4. [www.innovationeu.org/news/innovation-eu-voll-1/0064-university-of-extremadura.html](http://www.innovationeu.org/news/innovation-eu-voll-1/0064-university-of-extremadura.html).
5. [www.globalfeedintariffs.com/2010/07/07/spain-causes-confusion-by-meddling-with-wind-and-solar-feed-in-tariffs/](http://www.globalfeedintariffs.com/2010/07/07/spain-causes-confusion-by-meddling-with-wind-and-solar-feed-in-tariffs/).
6. See [www.comercioextremadura.org/consejeria/index.php?id=24](http://www.comercioextremadura.org/consejeria/index.php?id=24).
7. See [www.iclei-europe.org/topics/sustainable-procurement/](http://www.iclei-europe.org/topics/sustainable-procurement/).
8. Also termed “systemic design” by some researchers.
9. Subsequent to the study visit ADENEX has proposed a technician post within the administration to link with the private sector and address the issue of lack of institutional capacity. This would appear to be at a lower level than the proposal in this recommendation.
10. ICLEI Website : [www.iclei.org](http://www.iclei.org).



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## *Annex A*

### Learning models

This section provides some practical examples (learning models) to the Extremadura authorities to illustrate some of the approaches and recommendations suggested in the report. These models cannot necessarily be replicated in Extremadura as the local context needs to be taken into consideration. However, these models do intend to provide some practical guidance on how similar challenges were dealt with in other places that could be of inspiration for Extremadura. The following examples are included:

Table 12. **Synthesis of learning models**

Model	Region (country)	Recommendation/Approach
Clean Energy Economy Programme	Colorado (USA)	Support the attraction and development of businesses in energy-related sectors
Gangwon Green Growth (3G) Project	Gangwon (Korea)	Attract investment and build up green infrastructure
Regen SW	South West of England (UK)	Supply chain development to capture full economic benefits of renewables.
Belvedere SpA	Peccioli (Italy)	Develop waste management framework and support the emergence of a new green sector
Salix Finance	UK	Public sector lead on energy efficiency through “invest to save” programme or revolving fund
CO <sub>2</sub> Sense	Yorkshire and Humberside (UK)	Promote energy efficiency improvements in the private sector
Federazione Trentina della Cooperazione	Trentino (Italy)	Organise, simplify and rationalize training infrastructures, by easing the collection and analysis of skills needs and allowing a smarter provision of skills development services.

Table 12. **Synthesis of learning models** (*continued*)

Model	Region (country)	Recommendation/Approach
SKILLS Programme	Europe	Use an integrated approach to training for local development in a context of SMEs and by the need to share, rationalize and efficiently use resources.
Centres de compétence du Forem	Wallonia (Belgium)	Recognition and validation of learning outcomes for skills development. Also on how to support this kind of initiatives through a public-private partnership
South Styrian Cooperative for Energy Production	Mureck (Austria)	Partnerships for greening the economy and human capital. Use of local farm products, local waste and local resources.
Competitiveness Operational Programme	East of England (UK)	Develop institutional capacity for the green economy
Eco-Innovation Support through Clusters	Styria (Austria)	Make the best use of the Extremadura clusters by having a clearer focus upon the green economy agenda and upon the benefits of investing in eco-innovation
Green Public Procurement Policy	London (UK)	Coordinate efforts and initiatives towards the green economy by “leading by example”, notably by adopting green purchasing policy

## Clean Energy Economy Programme, Colorado (USA)

### *Description of the programme*

Colorado State’s clean energy programme has started as part of a so called Rocky Mountain Energy Producers (Colorado, Montana, New Mexico, Utah, and Wyoming) Programme. As the five states are experiencing a green transition, the clean energy and energy efficiency sectors have become all the more important to economic performance. The green economy programme involves many types of business activities and has been classified into five sectors: clean energy; energy efficiency; environmentally friendly production; conservation and pollution mitigation; and training and support.

### *Relevance to Extremadura*

Colorado is a state which holds a vast land with abundant natural resources, which is similar to that of Extremadura. Also, Colorado has been trying to find a new growth engine in the green economy and adopted clean energy strategy to address economic and labour market problems that have been caused by global recession.

### *Results of the approach*

Between 1995 and 2007, Colorado's economy added 30% more green jobs, compared to 19% in total state economy. Green jobs in Colorado are more concentrated in energy related (clean energy and energy efficiency) among the five states. The state has also attracted venture capital in the region (up to USD 800 million, 75% among the five states' total between 1999 and 2008).

- Colorado has 1 778 green establishments and 17 008 green jobs.<sup>1</sup>
- 3 567 green businesses are based in Colorado (50% of the Rocky Mountain Energy Producers').
- The state received 50% of the 5 states' total clean energy related patents.

### *Reasons for success*

Firstly, Colorado establishes a well-targeted public policy. Colorado has been determined to get 30% of the state's energy from renewables and to decrease energy consumption by 11.5% by 2020. In pursuing this policy goal the states are offering both carrot (incentives) and stick (regulation) in a balanced way. Secondly, the state offers an attractive business environment (real market, favourable business environment, and well-trained human resources). Thirdly, the mix of research institutes and skilled workforce is also a key to success. Colorado has accumulated expertise in engineering, computing and scientific research. Fourthly, there are abundant wind, solar, and geothermal resources in the State. Lastly and perhaps most importantly, strong and consistent policy and financial leadership has been presented. The state leaders have made significant green growth outreach efforts that have resulted in the successful inducement of global business to the region.

### *Obstacles faced and response taken*

The main obstacle faced by the initiatives was inadequate infrastructure in the region. This includes outdated electrical grid, lack of capacity and plans to properly respond to the needs, such as new construction demand for transmission lines. To address this limited infrastructure problem, Colorado has established a "state infrastructure authority" in 2007, and in particular, is limited in bonding capacity by the state's legislative cap on spending increases.

### *Considerations for adoption in Extremadura*

Though the policy settings are a little different between the two regions, Colorado's experiences seem to have great implications for the government of Extremadura. Both regions have immense territories that are rich repository of natural resources. In due respect, Colorado case is both interesting and worthwhile to visit, especially in terms of showing policy leadership, building infrastructure for green economy, attracting venture capital, and cultivating skilled human resources. Given that green growth is a determined political will in Extremadura, a systemic approach to weave relevant efforts to reach the goal should be a next step. For instance, more coordinated activities, such as offering tax preference, convenience, etc. to induce and promote green businesses in the region are necessary, as it was the case of Colorado. A close look into the discreet use of carrot and stick measures would also be a meaningful work.

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## **Gangwon Green Growth (3G) Project in Korea**

### *Description of the programme*

The Korean government initiated its Green New Deal in 2009 as a way to address economic crisis as well as to create a new engine for sustainable growth. Under the Green New Deal, the government is investing approximately USD 93 billion (average 2% of GDP investment during these years), 1% of which is allocated to bring up 100 000 core green talents over the 2009-2013 fiscal years. However, even a year before the national initiative, Gangwon province had started its own Gangwon Green Growth (3G) project in April 2008. The 3G project aims to pursue 5 policy directions: 1) greenhouse gas (GHG) reduction; 2) adaptation to climate change; 3) top-notch green research and development (R&D); 4) green infrastructure; and 5) international networking, collaboration and promotion of the province (centre of excellence in low-carbon, green growth). The mid-term project makes average 10% of the province GDP investments in green area until 2012.

### *Relevance to Extremadura*

Gangwon is the largest province in surface (17% of total land) with the lowest population density (87 inhabitants per km<sup>2</sup> or 3.3% of total population) in Korea. The province is abundant with natural resources, as a result, service industry particularly tourism stands as the most important area of business. However, the population has shown a shrinking trend while ageing and jobs opportunities are contracting. Consequently, the province represents only 2.6% of the national GDP. In this regard, the socio-economic environments between Extremadura and Gangwon might be considered as similar. Like Extremadura, Gangwon province also finds green growth as a breakthrough to create new growth engine, and thereby to make sustainable development happen in the region.

### *Results of the approach*

The 3G project was the first initiative among the 7 metropolitan cities and 9 provinces in Korea. All in all, Gangwon province has focused on new and renewable energy sources. It has seriously invested on R&D in these fields (up to USD 1 080 million between 2008 and 2012), while at the same time created large scale new and renewable energy clusters since 1996. As a result, Gangwon alone represented 24.5% of national new and renewable energy production in 2008. Gangwon has also made efforts to attract venture capitals (up to USD 600 million in 2009) as well as green research institutes in the region. As part of its 3G project, the province invited Batelle (2008) and Scripps Institute (2009) to establish itself as a leader in bio-medical industry sector. Gangwon's 3G initiative has been highlighted among the nation when the President of Korea visited the province in February 2009 and instructed the province to create low-carbon green cities in the region with full supports from the central government.

### *Reasons for success*

Firstly, Gangwon establishes a well-oriented new growth policy. Under the strong leadership of the governor, the province has set up a policy goal until 2012 of getting 10% of its energy from new and renewable sources as well as decreasing GHG emission up to 6% compared to the level in 2003. Secondly, Gangwon has actively engaged in building up an active network which includes social partners, research institutes, universities, and central and local governments, etc. Thirdly, Gangwon has been offering a good green business opportunity but also attracting serious venture capitals in the region. In doing so, the province above all has concentrated on building green infrastructure, such as energy, bio and medical clusters, green R&D centres. Fourthly, like Extremadura, there are abundant natural resources in terms of

wind, solar, and water in the province. Lastly but perhaps most importantly, strong and consistent policy and financial leadership has been presented by the authorities of Gangwon. This commitment has resulted in attracting serious venture capitals and businesses into the region.

### *Obstacles faced and response taken*

Gangwon is one of the least developed provinces in Korea; accordingly, brain-drain has been a serious issue. This is also the region where the problem of inadequate infrastructure and lack of decent universities or research institutes has been chronic. Therefore, Gangwon's policy direction to invest heavily in green energy R&D and infrastructure, while at the same time induce world-renowned research institutes and venture capitals into the region seems to be rightly set. The head start Gangwon's green project happened to be directly in line with the national Green New Deal initiative and eventually caught central government's attention, which resulted in securing full supports from the central budget (e.g. to create low-carbon green cities featuring green transportation, low-carbon buildings, low-carbon energy, water and resources recycling, and eco green belt in the province).

### *Considerations for adoption in Extremadura*

Gangwon's 3G project is still under way. Nonetheless, the province's experiences, in terms of establishing green infrastructure as well as policy network, attracting R&D institutes and venture capitals, and as a result inviting national budgets seem to be an exemplary precedence. Most of all, determined long-term commitment and policy leadership have been the backbone in proceeding with the initiative. To promote green businesses in the region, Gangwon led by the governor has exerted itself to afford companies every convenience which includes developing and providing industrial complexes, building logistics infrastructure such as expressways and railways. Considering both regions have large territories that have plenty of natural resources while they both lack in human resources and business opportunities, Gangwon's initiative seem to have a lot of suggestions for Extremadura.

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## Regen SW, South West of England (UK)

### *Description of the model*

Regen SW is the sustainable energy agency for the South West of England region. Their objectives are to accelerate the deployment of sustainable energy technologies, and to boost the number of green jobs in the region. Regen SW's activities cover a range of projects and programmes, including work on demand creation and supply chain development. Regen SW works with developers and other stakeholders involved in large sustainable energy projects in the region, such as the planned development of one of the world's largest offshore wind projects. Regen SW has been instrumental in lobbying government to get major projects approved, and overcoming planning and regulatory hurdles. They have then worked with project developers to identify potential supply chain opportunities for companies in the region – for example identifying how local firms can engage in generic and specialist construction work associated with projects, as well as supplying components and materials. Regen SW also works on the supply side, by networking and developing companies in the sustainable energy sector. Some of the most useful outputs from this work have been a supply chain directory (printed version and online), and supply chain events – such as a recent event on offshore wind which brought together government policymakers and regulators, project developers, and supply chain companies.

### *Relevance to Extremadura*

This model is relevant to Extremadura given the number of significant planned sustainable energy projects – for example concentrated solar thermal plants. There is a risk that some of these projects will not come to fruition due to planning, regulatory and financial hurdles. The Extremadura region needs a representative to lobby for these projects to proceed, and work with project developers so that projects are progressed. There is also a risk that much of the economic benefit of these projects will leak outside the region, as the developers bring in outside expertise. Therefore there is a need to work with the sustainable energy sector in Extremadura to build capacity and identify regional strengths. To an extent this work is already ongoing through the Energy Cluster but it could be enhanced.

### *Results of the approach*

Regen SW has contributed to several projects coming forward which were potentially at risk. This will ensure that there is significant investment in sustainable energy in the region. Regen SW is also now working to ensure that necessary infrastructure and skills are in place to companies in the region to take advantage of supply chain opportunities. Supply chain

opportunities are now beginning to flow from these major projects, and due to the work to raise the profile of sustainable energy companies in the SW region, it is anticipated that a high proportion of the economic benefit associated within these projects will remain in the region.

### *Reasons for success*

Regen SW have addressed both demand and supply through their work. They have used their strong links into government to lobby for projects to go ahead, and have been successful in interacting with project developers. They have used innovation methods such as the supply chain events to increase interaction between project developers and supply chain companies.

### *Obstacles faced and response taken*

The main challenge with this type of approach is to get sufficient interaction with project developers and supply chain companies. Regen SW were able to gain trust and confidence from the developers by assisting in taking projects through the planning stage. They managed to get sufficient interaction from supply chain companies by highlighting the significant economic opportunities available to companies. Developers and supply chain companies identified the excellent skills and capabilities within Regen SW as one of the reasons for its success – which has enabled Regen SW to develop status as the “trusted advisor” on all matters relating to renewable energy in the region.

### *Considerations for adoption in Extremadura*

This model needs to be adapted to align more closely with the types of projects coming forward in Extremadura, and the context of the region. The most significant planned project investments in the region are concentrated solar thermal. Given that some of these projects are at risk, there is a need to lobby government and project developers in order to ensure that they are progressed. The region needs its own voice on renewable energy, to ensure that the region’s interests are represented – and this could be provided for instance by the Energy Cluster. However, the representative needs to be given more control over the renewable energy strategy for the region than at present. More work is needed on supply chain development, which may require additional resources to work with sustainable energy supply chain companies in the region than at present. This additional work should be taken forward by the Energy Cluster, building on their existing work in this area and networks.

*Further information*

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**Belvedere SPA landfill energy plant, Peccioli (Italy)***Description of the model*

Twenty years ago, Peccioli, a small Tuscan city of 5 000 inhabitants near Pisa, was confronted with the regional government's proposal to concentrate the waste produced by 40 other municipalities, including Florence, in their municipal landfill. The population was ready to demonstrate against this decision but the Mayor decided to transform the regional decision into a local development opportunity.

To justify the development the citizens were told that the landfill would not pollute and that investments would be made to widen, sanitise and engage in a significant production of biogas, from co-generation of an electric energy plant (to be sold to the National Electricity Company) and a teleheating system for the supply of hot water to the inhabitants.

*Relevance to Extremadura*

This model is relevant to Extremadura in various ways. Firstly, it highlights the importance of strong leadership to support the development of green activities and the emergence of a new economic sector. Extremadura needs to identify its leader and work collaboratively towards a common objective in terms of the green agenda. Also, this example illustrates the benefits that a well planned and fully supported public-private initiative can have on the territory. In Extremadura, it would be important to strengthen the public-private-civil society partnerships in order to achieve stronger results. Finally, it supports the idea that waste management can lead to job creation and economic growth if the project is solid enough. This is an area of opportunity for Extremadura and this model can serve for inspiration.

*Results of the approach*

Profits from the landfill and its electricity production have allowed the municipality to invest in schools, car parks, local infrastructures and social services, thus improving the quality of life in the community. The Mayor became a “collective” entrepreneur on behalf of the local community, playing a coaching and leadership role too often missing in local authorities.

In 20 years, this operation has generated over EUR 250 million and created 300 jobs directly and indirectly. From 1990 to 1997 the landfill was managed directly by the municipality of Peccioli. From 1997 the management of the landfill was entrusted to BELVEDERE SpA, a company based on a Public Private Partnership. The company has assets of over EUR 40 million. Belvedere has invested in local development by:

1. buying 900 hectares and 40 rural properties promoting environmental tourism and ecological farming;
2. developing one hectare of land for a pilot solar energy plant;
3. establishing a wind turbine energy park in the landfill's recycling plant;
4. promoting a co-operative specialised in gardening and cleaning, employing 120 people;
5. promoting a health-care co-operative to assist handicapped people and their families, employing a staff of 20;
6. building the first experimental plant in Europe to test molecular dissociation in waste recycling;
7. promoting a co-operative to manage hotels and tourist activities;
8. supporting and sponsoring a number of local cultural initiatives such as a Museum of Russian Icons, cultural events and theatres, sport facilities, innovation and research.

The Peccioli landfill energy plant has been certified by the EU Eco-Management and Audit Scheme (EMAS). The City of Peccioli and the Sant'Anna School of Economy in Pisa have been partners for over 15 years, showing how productive the collaboration between a university and its local community can be.

### *Reasons for success*

One of the key reasons for the success of the initiative in Peccioli was the strong leadership of the Mayor Renzo Macelloni. He was a true believer in the benefits of starting such a system in the city in terms of employment and economic development. When it was decided that Belvedere was to be established, it was also a key factor of success the fact that the inhabitants could buy shares and therefore become part of the project. Indeed, 60% of the shares are owned by the municipality and 40% are owned by almost 1 000 citizens. Since 1997 it has paid an overall dividend of 7% to the shareholders. Nowadays, the population fully supports Belvedere.

### *Obstacles faced and response taken*

At the beginning it was difficult to obtain the support of the population due to the negative (mis)perception of waste management (e.g. bad smells, damage landscape, etc.). The Mayor undertook an intensive communication strategy, speaking about the opportunities for the city but also about the challenges, building links of trust with the community. This provided him with the supported needed to move the initiative forwards.

### *Considerations for adoption in Extremadura*

This model could be adopted by Extremadura if the authorities decide to bet on the sector and communicate effectively on the benefits to the population and the business sector. Extremadura would need to ensure that a strong communication campaign is in place to support the development of similar initiatives in waste or related sectors. The population needs to be aware of the opportunities ahead and the challenges too. The population would also need to endorse the project and own it, either directly (through shares) or indirectly. Extremadura should build on existing assets in the region in order to pursue an agenda like this. The relevant institutions involved in waste management should come together in a common agenda. Leadership and long-term commitment from the public sector will also be essential is Extremadura is to consider a similar initiative. Finally, Extremadura should need to ensure that the skills needed are used from within the pool of workers in the region so that the benefits remain in the region and therefore obtain the support of the population.

### *Further information*

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## **Salix Finance, UK**

### *Description of the model*

Salix Finance is a government-sponsored agency which provides finance for investment in energy efficiency by other public bodies through an innovative “revolving fund” model. The objective of the organisation is to boost investment in energy efficiency, resulting in cost savings, CO<sub>2</sub> savings, and supply chain opportunities for firms in the energy efficiency sector.

Salix Finance works with a number of clients across the UK – such as local authorities, universities, hospital trusts, and other public bodies. Salix Finance provides an initial allocation of funding (typically GBP 500 000), which is matched by the recipient public body into a funding pot for use by the public body (*i.e.* total of GBP 1 million). The recipient public body identifies a list of potential energy saving projects, the most cost-effective of which are then implemented by the fund. The public body must then agree to pay back the investment to the fund out of the money they save on energy bills. Due to the focus on high-impact, cost effective project investments, the payback is usually 5 years. As the public body repays the investment, the fund can then implement the next phase of investments, and so on. The public bodies involved benefit through energy savings and reduced energy bills.

Overall, this model ensures that the public body achieves energy savings, and results in the greatest impact from the initial investment by Salix Finance.

### *Relevance to Extremadura*

This model is of relevance to Extremadura in increasing the investment in energy efficiency. Through this review, a key weakness highlighted was the lack of interest in or finance for investment in energy efficiency in the public sector. This model overcomes the shortage of finance by allowing public bodies to utilise revenue funding to invest in capital expenditure. If implemented in Extremadura, this model could mean that public bodies can demonstrate leadership in energy efficiency, whilst creating demand for energy efficiency goods and services, and ensuring the growth of the sector in the region.

### *Results of the approach*

Salix Finance has invested over GBP 30 million in energy efficiency, working with a large number of public sector bodies across the UK. Salix has developed specific programmes addressing key elements of the public sector (universities, NHS, colleges, local authorities) which have resulted in leadership and best practice within these sectors. The Salix Finance methodologies and tools have underpinned other similar schemes in the UK.

### *Reasons for success*

One of the key reasons for the success of the project is the strict criteria which are applied to project investments. Investments must achieve a payback of a maximum of 5 years, and the maximum investment available is GBP 100 per tonne of CO<sub>2</sub> saved. Salix has a list of approved technologies which meet their investment criteria. This ensures that the fund will receive

sufficient repayments to operate on an ongoing basis. Another reason for success is that Salix Finance has shared best practice within the network of public sector organisations they support. A third success factor is that one of the criteria for the initial investment is to have high-level management buy-in for the fund within the recipient organisation, as well as an environmental management system. This ensures that the recipient organisations have a high level of involvement and commitment to the fund on an ongoing basis. The buy-in from participant organisations has been achieved by demonstrating the financial benefits to the organisation – rather than appealing to their corporate social responsibility.

### *Obstacles faced and response taken*

The main barriers to involvement by public sector bodies include a lack of match funding, a lack of technical expertise to identify potential energy efficiency investments, and a lack of management capacity to manage the fund. Salix Finance addressed these issues by allowing groups of similar public sector organisations to develop a collective fund – thus creating sufficient critical mass to make the fund worthwhile. Salix Finance also shared best practice across the network of participant – improving technical expertise.

### *Considerations for adoption in Extremadura*

This model could be applied in Extremadura in its current form – provided that initial funding could be made available by the regional or national government. This would then be matched by regional departments and external public sector organisations including the university, hospital, and town councils. In order to make the fund work efficiently and correctly, the regional government would have to appoint an overall fund manager. This could either be a government department, external body such as ADENEX, or a private company such as a technical consultancy. The fund manager would have to have financial skills and knowledge of energy efficiency technologies. They would have to develop criteria for investment, and technical guidance on available energy efficiency technologies. Ideally, the fund manager would also work to identify existing energy efficiency companies in the Extremadura region who can provide goods and services.

### *Further information*

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## Carbon Action Yorkshire/CO<sub>2</sub> Sense, Yorkshire & Humberside (UK)

### *Description of the model*

Carbon Action Yorkshire (CAY) is one of a number of projects delivered by the Sustainable Futures Company in the Yorkshire and Humberside region of the UK. The objective of the CAY project was to work with the 100 largest private sector companies and public sector organisations in the region to help them reduce their carbon footprint, and accelerate the transition to a low carbon economy in the region. CAY provided support to businesses in how to manage and reduce energy use and carbon footprint, and sought to secure carbon reduction commitments from the region's largest emitters. CAY offered grants to participant companies to encourage further investment in low carbon products, services and low carbon innovation. Working with partners, the project also sought to stimulate the uptake of low carbon products and services.

The CAY project formed part of a wider suite of projects and programmes delivered by the SFCo, including the Future Energy Yorkshire project to increase the deployment of renewable energy in the region. The SFCo has recently been rebranded as CO<sub>2</sub> Sense.

### *Relevance to Extremadura*

One of the barriers to the uptake of energy efficiency in Extremadura highlighted through the review is the low level of awareness of energy efficiency in the private sector. Consequently the current level of investment in energy efficiency in the region is low. There is a strong rationale for the regional government to intervene to bring about improvements in energy efficiency in firms both to improve productivity (through lower costs) and to reduce carbon emissions. In order to catalyse change in the private sector, the regional government will have to provide funding for information, best practice, advice and guidance, implementation support, and potentially implementation finance. All of these services were provided through the CAY project.

### *Results of the approach*

The CAY project has resulted in significant leverage of private sector investment in energy efficiency – from an initial investment of GBP 1 million in the CAY, there was leveraged private sector investment of over GBP 11 million. The investment resulted in annual carbon savings of 130 000 tonnes, a reduced energy spend in businesses (and hence greater productivity), jobs created/safeguarded and businesses created.



### *Reasons for success*

One of the key success factors for the CAY programme was that client managers managed to secure a high level of trust and buy-in from participant companies. In part this was due to the high level of professionalism and knowledge displayed by the CAY staff. CAY was also a strong facilitator of partnership working between participants, providing opportunities for networking and forums bringing together companies to share best practice. CAY provided a whole suite of support services to firms including information, best practice, advice and guidance, and grants for implementation.

### *Obstacles faced and response taken*

The main challenge for the CAY project was the recruitment of companies to the programme. However, CAY staff were able to demonstrate to senior contacts the potential energy and carbon savings achievable through investment in energy efficiency, and how this could impact on profitability. Cost savings were the primary driver for involvement by companies (not carbon savings).

### *Considerations for adoption in Extremadura*

The adoption of such a programme in Extremadura would assist medium and large companies (energy intensive sectors in particular) in the region to respond to the sustainability agenda and improve their energy efficiency. Anecdotal evidence from interviewees suggested that firms in the region do not realise the potential benefits of more sustainable operations to their business. A project such as CAY would not only improve the profitability of firms in the region, but would also create demand for low carbon goods and services.

The scope of the project in Extremadura could mirror that within the CAY programme – the main elements can be replicated in Extremadura. The programme could be developed by one of the business support agencies or NGOs in the region, but would require public funding support (as firms are generally not willing to pay 100% of the cost of support provided). A key success factor for the CAY project was to be able to offer firms implementation grants which followed on from the advice given.

### *Further information*

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## Federazione Trentina della Cooperazione, Trento (Italy)

### *Description of the model*

Trentino, a region in Northern Italy, is home to 600 cooperatives involving 227 000 members, in a population of approximately five hundred thousand inhabitants, *i.e.* two families out of three are involved in the cooperative movement. The “Federazione Trentina della Cooperazione” is a unique model, supplying its affiliated companies with a number of services: major activities of the cooperative movement regard the agriculture sector, where cooperatives manage the total production in wine, fruits and vegetables, and milk and cheese. Other activities concern training, financial services, consumer goods, agriculture, housing, and social services. Cooperatives and other forms of social entrepreneurship have played a key role in the flourishing of the economy in the province, which is one of the richest and best organised in Italy. The excellence of these organisations is recognized at the national level, to the extent that Trentino is considered as a “cooperative district” like few others in the world. The “Federazione Trentina della Cooperazione” also manages and organizes education and training supply and information and awareness raising services. Education and training provision is a very important asset of the Federazione’s work and it managed by managed by “Formazione Lavoro”, which is in charge of:

- VET courses for the Federazione’s members and the cooperatives’ managers. Curricula embrace a range of topics, from those pertaining to the cooperative system, to transversal competences, but also green skills: as a number of cooperatives work in the renewable energy sector, courses are organized also in energy related disciplines. In any case, informative actions on green economy and low-carbon development are organized for cooperatives working in all sectors.
- Educational activities in schools on themes relative to cooperatives are provided from early education stages to upper secondary education, and they are carried out in cooperation with the Province of Trento.
- Although without a specific mandate, the Federation manages cooperatives’ initiatives for lifelong learning and continuous vocational education and training.
- There’s a proposal for organizing compulsory training for managers, especially non-formal training, on entrepreneurship within the cooperative system.

“Formazione Lavoro” undertakes a “holistic approach” to training by carrying out skill needs analysis for the Federazione’s members, it manages training supply and in some cases it also evaluates and certifies competences and learning outcomes. For instance, “Formazione Lavoro” developed a

“curriculum of the cooperative member”, whereby each person’s personal skills and career development is taken care of, from skills audit, to a service of counselling and continuous assessment, also with reference to new skills, to the evaluation and validation of skills and competences.

### *Relevance to Extremadura*

As in Extremadura, the business tissue of Trentino is composed by medium, small and micro enterprises, where jobs and responsibilities, also with reference to green tasks, are not always well defined. A cooperative unites small and micro enterprises and provides them with services, which are tailor-made for the sector and of the companies it represents. This model may help Extremadura to organise, simplify and rationalize training infrastructures, by easing the collection and analysis of skills needs and allowing a smarter provision of skills development services. In Extremadura, aggregating small and micro enterprises in a cooperative network would better address the need to understand what is the “green” potential of different areas in the region, as their peculiarities widely differ and a one-size-fit all approach would not be appropriate. Cooperatives could also serve as a model for Extremaduran farmers and employers to develop brands for better selling their products in Spain and abroad, consequently adding value to their productions. The forthcoming training activity for cooperatives managers, aimed at promoting a new approach to business management, shows how this model can serve also to foster entrepreneurship and to communicate with adult and young entrepreneurs.

### *Results of the approach*

The effectiveness and efficiency of Trentino’s cooperative movement is recognized not only in Italy but also worldwide. The main outputs and outcomes of the cooperative movement are reflected in the capacity of transforming and selling local products, giving added value to natural resources of the land. Cooperatives also help producers to cope with economic transformations linked to green growth, ensuring a just transition, also with good wages for their members. Cooperatives provide for high quality products, environment protection, high quality of life standards, employment growth and the creation of branding. In 2008-2009, cooperatives’ production in Trentino amounted to 944 million euro.

### *Reasons for success*

The Cooperative movement in Trentino succeeded mainly because of the communities’ engagement in supporting local development, suiting the needs of the territory, in due respect of the subsidiarity principle. This is

linked to the cultural, economic and social background of the region, which has been used as a stepping stone for developing local capacity in the context of economic transformations. It can be a learning model for Extremadura, as the local starting conditions are the same: majority of SMEs, green potential, agricultural production, the need to recognize quality of the land, the need to manage adaptation to green transformation. A major element of success relies in the efforts towards common goals of the whole population, whose solidarity and autonomy, without necessarily relying on public financing, developed solid ties in the workforce and the capacity of triggering bottom-up initiatives.

### *Obstacles faced and response taken*

During the economic crises in the Trento area, cooperatives faced serious challenges that were overcome thanks to social cohesion, values, and mutual trust, which are the real strength and the characterizing feature of the cooperatives. The major obstacle of this model, however, is the need of reconfirming the engagement of all members, the old and the new ones, in the cooperative network. The Responsible of Education and Training of the Federazione Trentina della Cooperazione, Mr. Egidio Formilan, said that cooperation is a bet that needs to be reaffirmed and updated each and every day, and it mainly builds upon mutual trust and a socio-economic pact among different generations. Another obstacle is cooperative companies' management, that is to say the management of increasingly big companies, with a considerable turnover, coherently with the cooperatives' values. To this end cooperatives are going to promote specific training activities. In any case, as stated by the Federazione itself, the major response of the system did not rely only on an organizational model or its infrastructures but on everybody's efforts and contributions, with a bottom-up approach. What is more, the cooperative system, although rooted in the local territory, searched an international projection, by engaging in activities and looking for representation at the European level.

### *Considerations for adoption in Extremadura*

This model could be of major interest for Extremadura as it shows how an effective, organised and efficient use of local resources leads to success. With respect to training for green skills, the cooperative system shows a governance mechanism that could serve to the region as an example for better organizing the training and employment centres, spread all over the territory. A number of stakeholders should be involved, especially SMEs and their representatives, but the cooperatives system works thanks to the engagement of the whole population. Therefore, Extremadura inhabitants should be able to express their interest to engage in setting up such a system. Then, the first step of a possible agenda for moving towards this model, would be a clear and shared picture of the labour market and of the training supply system with particular reference to skills' needs.

*Further information*

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**SKILLS Programme***Description of the model*

In 2009, the Co-operative Development Agency in Sweden, the Federation of Cooperatives in Trentino in Italy, the Swedish TelePedagogic Knowledge Center, the University of Mondragón's Co-operative Studies Institute in Spain, and the Turkish Institute of Anadolu Bil Meslek Yuksek Okulu promoted in SKILLS, a project co-funded by the Lifelong Learning Programme – Leonardo da Vinci sub-programme. The project offers a learning model for skills development and the validation of non-formal and informal learning outcomes at the local level, with particular reference to the area of cooperation. The SKILLS project developed a methodology and a model both to cope with training needs of specific targets, and to analyse and validate invisible non-formal and informal learning outcomes. In particular, it had three objectives: firstly, to strengthen the bottom-up nature of cooperatives by developing common informal and non-formal training programmes; secondly, to validate professional experience in the cooperative sector; thirdly, to develop innovative learning programmes and materials based on partners' experience and cooperative learning methodology.

*Relevance to Extremadura*

Beyond its international dimension, SKILLS offered each partner a “holistic approach to training”, adaptable to the different national, regional and local contexts. SKILLS also shows how awareness raising about a new concept of training can be carried out, through dialogue, negotiation, by means of meetings and discussion: the project helped all partners to learn about non-formal and informal learning, stretching beyond the traditional borders of managing training supply. SKILLS is a learning model for Extremadura in so far as it shows how an integrated approach to training for local development works, in a reality characterized by small and medium enterprises and by the need to share, rationalize and efficiently use resources. This learning model shows how cooperation would help small and micro enterprises in the region to connect the aspect of skills needs analysis, training provision, validation of non-formal and informal competences, creating an interconnected system for monitoring, easing and managing the green

development of the workforce and of companies. In particular, skills balances and the validation of non-formal and informal learning relate to the recommendation of ensuring appropriate tools for skills development. Finally, the availability of on-line instruments would help people to develop learning also in self-training sessions, via e-Learning, broadening the learning options available. This is relevant to Extremadura also as regards the lack of properly skilled trainers, a goal specifically addressed by the SKILLS project.

### *Results of the approach*

A major result of the project for each country is awareness rising about the concept of non-formal and informal learning. The project partners realized that many of the activities realized within the scope of their activities were relevant as opportunities of continuous training. In light of this new concept of non formal and informal training, partners at the local level developed strategies and methodologies (*e.g.* the tutor), to create innovative learning path, encompassing a new concept of training, much broader of the formal in class training. The Project helped to train workers but also trainers at different levels (in VET, university, companies, etc.), by foreseeing a personalized training supply and a service for validating non-formal and informal learning. The project showed that the cooperative system entails a learning mechanism that ensures the preservation of local and traditional knowhow, which is transmitted to new members, which enter in the cooperative network, either because they substitute old workers who exit the labour market due to retirement, death, etc. or because they get involved in the cooperative (especially, during growing periods). The SKILLS project is a learning model, as it also designated independent evaluators for non-formal and informal learning. Besides the overall outcome of the project, it is interesting to know which products were created, as concrete tools for implementing SKILL's objectives:

- Skills Presentation Slides;
- Analysis report (An analysis of the possible future of the project results – learning system, didactic materials, catalogues, training opportunities);
- Learning System (a guide for using Skills products);
- The System of Validation (the guide of the validation of non-formal and informal learning for co-operators);
- The Balance of Skills (the cooperative systems involved, their similarities and differences, the skills necessary);
- The Skills Framework (the skills necessary for promoting the cooperative identity throughout the ICA principles);

- Learning Occasions (the formal, non-formal and informal learning occasions in the cooperative system involved);
- Learning Framework (the existent non-formal and informal learning occasions present in the cooperative system involved);
- Cooperator Curriculum (co-operator skills according to the 3 levels of the co-operator life cycle);
- Web-platform (the project website);
- Catalogue (the presentation of Skills project and results).

### *Reasons for success*

The SKILLS system had a multiplier effect as it could be used at different levels and for trainers engaged in different training tracks, *i.e.* vocational education and training, university, continuous vocational education and training. Moreover, an international and comparative approach helped in sharing best practices and in anticipating and coping with possible obstacles. Finally, SKILLS's success relies in its long-term impact on the cooperative enterprises at local and national level that understood how to offer learning possibilities to their members in order to increase awareness on the importance of lifelong learning. The project also encouraged single co-operators to become more active and aware in their cooperatives.

### *Obstacles faced and response taken*

A major obstacle was the communication and the understanding of a new concept of training. In each partner country education and training supply followed traditional paths and methods, such as in class lectures, management by disciplines, curricula structured without the concept of competences, etc. The Turkish but also the Spanish partners did not have a model to refer to and the idea of “non-formal and informal learning” was not taken for granted in their countries and cultural contexts. In order to overcome this barrier and to share a common dictionary, it was necessary to align all partners on the same objective: to this end several meetings, also on-line and with the help of e-Learning instruments were organized.

### *Considerations for adoption in Extremadura*

Extremadura could implement the principles of this learning model creating services for the validation of non formal and informal learning outcomes and training for independent evaluators, possibly those employed by public employment services. All actors at the local level should engage to trigger the virtuous cycle of knowledge sharing that characterized the SKILLS project.



Employers, trainers, social partners and public employment services would be integrated and they would more easily share information about green skills, training and competences' development for green jobs, and the strategies to be enacted to this end.

### *Further information*

For more information on the SKILLS project, visit <http://www.skillcoop.eu>/or the websites of the partners of the project:

- Trentino Federation of Cooperation – Project coordinator, Via Segantini, 10, Trento, Italy, [www.cooperazionetrentina.it](http://www.cooperazionetrentina.it), [progetti.eupei@ftcoop.it](mailto:progetti.eupei@ftcoop.it)
- LANKI –Lankidetzaren Ikertegia (ES) [www.lanki.coop](http://www.lanki.coop)
- Coompanion Kooperativ Utveckling Skaraborg (SE) [www.coompanion.se](http://www.coompanion.se)
- Swedish Telepedagogic Knowledge Centre (SE) [www.pedagogic.com](http://www.pedagogic.com)
- Anadolu Bil Meslek Yusek Okulu (TR) [www.anadolubil.edu.tr](http://www.anadolubil.edu.tr)
- Kemi-Tornion Ammattikorkeakoulu (FI) [www.tokem.fi](http://www.tokem.fi)

## **The Network of the “Centres de compétence du FOREM”, Wallonia (Belgium)**

### *Description of the model*

The FOREM (the Walloon public service for employment and training) was set up in 1961, while its 25 *Centres de compétence* (Training centres) were created in 2001 as poles for training, monitoring and awareness rising. Their activities lie within logic of economic and social development, to answer workers' and companies' skills needs. The training centres of FOREM are conceived according to an open-source and integrated approach to training: the centres combine training with placement services, for instance offering individualized coaching to unemployed people. This is due to the nature of the FOREM, whose main scope of activity is placement, also thanks to the infrastructure of the *Maisons de l'Emploi* and the *Relais de l'Emploi*. The latter, together with the 25 *Centres de compétence* offer space for a new way of training, which combines knowledge sharing, abilities development, expression of innovation and creativity. They are interlinked in a network of certified centres and they can issue qualifications with regard to environmental sectors. A specific branch of activities released and certified by the Centres



is dedicated to green jobs and professional profiles in environmental friendly sectors. Among the other sectors for which the centres provide training, there are: energy management, waste management and renewable energies, like maintenance in the wind sector, in the solar PV and biomass sectors.

### *Relevance to Extremadura*

This programme interests Extremadura because it shows how green skills can be developed creating synergies using existing resources and targeting specific groups of the population. In particular, it offers good practices for increasing young people's interest in green jobs such as special internships for "tasting" different jobs, in agreement with the new approach of the European Commission to guidance and youth access to the labour market. Finally, the Walloon learning model is relevant to Extremadura as it provides tools for skills development, like the recognition and validation of learning outcomes. The Centres of the FOREM network ensure that training is intimately linked with labour market changes, in the perspective that skills development is a major social protection tool to gather the opportunities offered by new and redefined jobs. Finally, this is a learning model to show how social dialogue can be a lighthouse in supporting a just transition: the 25 training centres work thanks to a partnership involving the FOREM, social partners, associations of sectoral branches, research centres and the university.

### *Results of the approach*

A complete catalogue of training is available now for the country, which helps different targets of the population to address their skill needs. A systematic monitoring – at the level of the network of the centres – is carried out through qualitative interviews and quantitative surveys, in order to analyse and anticipate skill needs and consequently adapting training supply. Data collection relies on the analysis of trade unions, employers, and sectoral branches, where they are available. A descriptive study of the training ecosystem is carried out for better understanding market actors, training needs, and transformation dynamics in different activity sectors. Finally, there is a strong job focus to fight shortfalls in manpower, especially in relatively known sectors and occupations, like the green ones. With reference to green skills, the "*Centre de Compétence Environnement*", endorsed by the Walloon government and operating since 2005, analyzes the labour market skill needs in terms of job profiles and competences in the sectors of energy and environment. Experts in pedagogy compose the team in charge of this analysis, which is carried out on the basis of information collected from federations and sectoral social partners on the territory. A report is published every two years but a more intense monitoring activity is at the heart of possible developments of the system.

### *Reasons for success*

This learning model shows how to create a network of training centres in a relatively small territory providing for harmonic, coherent and consistent services. The network of the centres ensures a red thread of the training actions on the territory, creating synergies, making the best use of the resources and sharing good practices. Training supply is intimately linked to labour market changes and it is tailor-made for different target groups: young people under 25 years old, adult and older workers, special needs people, foreign workers but mostly unemployed people. For workers who lost their jobs, the Walloon system does also foresees specific services linked to the so called “*cellules de reconversion*”, that is to say a tool for accompanying unemployed people through a path of professional reconversion, training, access to the labour market.

### *Obstacles faced and response taken*

The main obstacles faced by LE FOREM are linked to governance and to the transformations of the regulatory framework of public employment services; the 25 Centres were created in 2001 and it is still hard to make a balance of their success. In any case, the approach promoted and adopted by the policy makers in the home country, always aimed at working in close contact with the labour market and its changes in order to adapt the system and ensure its effectiveness and responsiveness. In terms of work related problem, the “centres des competences” face major difficulties in managing the school-to-work transition phase. Young people often leave their schools without the necessary skills and level of competences to engage in the labour market, especially in technical jobs and disciplines. Skills mismatch is a dramatic problem in the Walloon region, as youth choices for school and universities are mainly oriented towards general education, leaving vocational education and training as a second choice. As a result, graduates in social sciences, communication, and other “soft” disciplines outnumber graduates in technical fields. This unbalance contradicts the penury of technicians and specialized workers, whose request by companies is increasing but unanswered.

In order to encourage young people to choose also technical and vocational education and training, Le FOREM set up “Technikids”,<sup>2</sup> a special programme for children between 10 and 12 years old, who are invited to discover technical and scientific jobs. Among the latter, ICT and green jobs are highly promoted. With reference to green jobs, LE FOREM aims at shading light on the skills and the nature of many green jobs – from renewable energies, to construction or transport – demonstrating that they are traditional skills, mainly in the technical fields and therefore requiring vocational education and training. In order to carry out all these jobs, basic competences in the field of mechanics or electronics are needed. Another answer to skills

development, also in disciplines linked to the green economy, is the training of VET teachers. As they often lack opportunities and resources to update their knowledge and abilities, in coherence with the labour market developments, the network of training centres offers them infrastructures for training (provided that LE FOREM is not responsible for financing teachers and trainers training).

### *Considerations for adoption in Extremadura*

This learning model could be adapted to the Extremadura context as it would represent a way of combining the need for more rationalization, organisation and coordination of training providers with the need of specific training for green jobs and the qualification of green skills. The network of public employment services, the Local Development Agencies and training providers should engage and rationalize their action in a limited number of centres which share a common red thread for training provision, services, etc. An on-line projection would help the network working and delivering its services. Finally, experiences at primary education levels could represent best practices for the region in order to raise awareness, disseminate information, along with the already existing programmes addressed to this age range (e.g. *Imagina tu Empresa*). Similarly, teachers and trainers training in Wallonia is a good practice for Extremadura.

### *Further information*

For more information <http://www.leforem.be/index.html> and <http://www.leforem.be/contacts.html> for more contacts.

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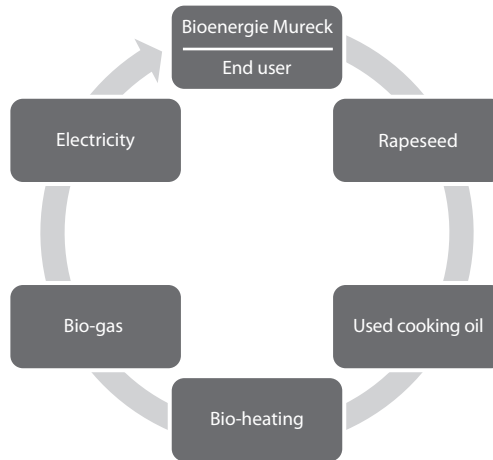
## **South Styrian Cooperative for Energy Production, Mureck (Austria)**

### *Description of the model*

In Styria (south-east of Austria) the engine of the economy relies on a cooperative model, whereby the most competitive players in a given sector establish their production in the region, manufacturing products on industrial scale. Consequently, they are able to attract other suppliers who either start up new businesses nearby or relocate their enterprises to the same region. Bioenergie Mureck is an example of this co-operative model in the energy sector, involving

more than local 500 farmers: it comprises three companies, namely SEEG Mureck, Nahwärme Mureck and Ökostrom Mureck, which cooperate to run the so called “Mureck Energy Cycle”, whereby they supply the entire Mureck region with electricity, heat and fuel. The Energy Cycle is based on the production of biodiesel and heating (for public and many private buildings) from rapeseed and used cooking oil, but also biomass (mainly wood and waste wood).

Figure 4. Mureck Energy Cycle



Reduction of oil per year: 15m litres

Reduction of CO<sub>2</sub> per year: 45000 tons

Source: Bioenergie Mureck.

### *Relevance to Extremadura*

The South Styrian Cooperative for Energy production shows the concrete role of partnerships at the local level, in the field of energy production, including biomass, who's potential Extremadura should better exploit for a greener economy. Even though the occupational impact of the biomass sector's development is not clear, the latter could contribute to the production of clean energy in the region and, as a result, to green the economy. Bioenergie Mureck shows how a farmers' local community can manage the renewable energy cycle, independently, completely relying on local farm products as well as on local waste. Extremadura should consider that this cooperative model brought in energy savings, costs reduction, and cheap, efficient and environmental friendly overall energy supply for the wider community. This model is a concrete example of partnerships at the local level for greening the economy and human capital, which would also be beneficial for Extremadura.

### *Results of the approach*

The main environmental results of this model do also entail an economic benefit for the local community: for instance, in the last three years, CO<sub>2</sub> output in this town was cut by more than 70%. The cost of biodiesel from the cooking oil, used by participating communities (e.g. by the city of Graz for the public bus transport network) and sold locally, is currently about 20% below the market price of traditional diesel. Available information suggests that the Mureck Energy Cycle is an environmental friendly model, which adds value for the region and to the local economy, but securing a number of jobs, in times of economic crises too.

### *Reasons for success*

The success of this project lies in the virtuous participation and strong collaboration of many individual units in a single organizational model, namely a cooperative. Through a cooperative, continuous supply of energy resources and constant sales are guaranteed. Moreover, Mr Karl Trotter, whose enthusiast work contributed to the success of the project, played a relevant role; this means that leaders and people with green values, motivation and commitment can make the difference. Finally, the Mureck Energy Cycle is based on a pragmatic and practical approach, taking into account feasibility and cost-effectiveness. Due to the regional approach of the project, the added value circulates within the region and resources can be used efficiently. Those who were responsible for the project, succeeded in carrying it out: nowadays the product today is not charged with petroleum tax and therefore it results as interesting also for other client groups. Due to the interest of the transport sector in this new fuel, the automotive industry focused on the issue and invented a system to add Biodiesel to conventional Diesel.

### *Obstacles faced and response taken*

The main problem in realizing a complete bio-energy cycle was linked to the costs of Biodiesel itself, which is more expensive than normal Diesel, and the need to effectively communicate it to consumers. Besides cost related factors, motor vehicles needed to be adjusted in order to use bio-fuels. As a result, initially the product was interesting only for the members of the cooperative and not for the whole community. This also means that communication skills are very important in order to disseminate new products and production methods. The presence of leaders and people embodying green values helped accompanying and making change possible.

*Further information*

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**Competitiveness Operational Programme, East of England (UK)***Description of the model*

This Programme has been developed as the East of England region's strategy to address the "Competitiveness and Employment" priority in the Structural Funds Regulations for 2007-13. The Programme has two overarching priorities, both of relevance to Extremadura. The first of these is the need to support the process of delivering growth. The second overarching priority is the absolute imperative to deliver the growth agenda in a manner that is cognisant of the region's carbon footprint and the need to stabilise and reduce it. These two imperatives are used to shape the Programme as a whole and provide the parameters and the rationale for activities supported by the Programme. The overall meta-theme is "Towards Low Carbon Economic Growth" and thus the development of the green economy and green jobs are central to the Programme. There is a particularly strong focus on renewable energy within the Programme. One of the four main objectives of the Programme is to accelerate the development of the environmental goods and services sector, including the development of clean technology businesses, products and services, and renewable energy.

*Relevance to Extremadura*

The Programme has relevance to Extremadura because of the ways in which it has been instrumental in developing institutional capacity within the East of England region and because the development of the green economy is the central focus. Institutional capacity has been developed through establishing a steering group with wide representation from all stakeholders. As part of the Programme workshops were held to agree strategy, the horizontal themes and programme management. A wide range of actors across the region were then invited to comment on draft policy documents, including local authorities, businesses, universities, the voluntary sector and the wider community.

Aspirations for the green economy have been advanced horizontally across the range of projects by building a series of "gateway questions" into the application process. These are intended to help applicants consider the relevant environmental impacts and consequences of the project. In addition, the Programme employs a dedicated environmental sustainability themes officer

who works with mainstream applicants to help embed best practice in sustainable development in all projects, as well as helping develop specific green economy projects. A recent review concluded that “the most effective form of information and support for improving the environmental performance of projects is the direct support of the Environmental Sustainability Theme Manager (ESTM), with 77% of projects that indicated they found this either very or quite useful also reporting that they felt their environmental performance had been enhanced. This concurs with findings from other regions that the roles of ESTMs in supporting individual project sponsors at all stages of development was seen as the single most effective activity in delivering environmental integration” (Fraser Associates and The Rural Development Company, 2005).

One specific project which has relevance to Extremadura in relation to the Scientific and Technological Park and the Iberian Centre of Renewable Energy and Energy Efficiency developments is OrbisEnergy in Suffolk, developed under the previous Programme period. This is a GBP 9.47m publicly funded project supported by a grant of GBP 2.73m from ERDF to develop the offshore renewable energy industry. The project contains three interlinked elements:

- the development of a new flagship building at Ness Point, Lowestoft, providing 3 300 m<sup>2</sup> space to a high quality build and environmental specification for developing the region’s offshore renewables sector;
- the development of this space into a model enterprise and innovation centre, comprising a lead anchor tenant, space for up to 40 renewables sector knowledge-based start-ups, inward investment companies and spinouts, plus conference facilities, seminar rooms and other facilities;
- the creation of a major focus for the industry within the region to encourage the wider generation of industry interest, investment and acceleration of the offshore renewables industry in the East of England.

The project is an integrated part both of the regional economic development of energy and environmental businesses, and the regeneration of the local area. As such, the project is intended to create a “critical mass” of offshore renewable presence that will of itself create sufficient demand for further market-led growth and expansion. The project is linked to skills training in the local college – Lowestoft College (see [www.lowestoft.ac.uk](http://www.lowestoft.ac.uk)), which has been designated a “Centre of Vocational Excellence” for offshore wind.

### *Results of the approach*

Under the Programme Support has been given for projects that effect sustainable consumption such as green procurement, eco-effective production processes and consumer access, together with information initiatives and energy efficiency demonstrator projects linked to economic development

objectives and outcomes. There has been support for key strategic developments linked to the growth of the clean technology and renewable energy sector. This has involved:

- support for renewable energy demonstrator or exemplar projects making use of wind, solar, biomass, hydroelectric and geothermal solutions;
- support for exemplar energy efficiency solutions, such as combined heat and power;
- provision of flagship business space (including incubator and “move-on” spaces) especially for green economy enterprises and those with eco-efficient design;
- support for community-based initiatives aimed at encouraging green or low carbon forms of economic growth.

### *Reasons for success*

A number of events were held to develop understanding about how to integrate horizontal theme considerations into project design into the Programme and this is now an established working method in the East of England. A case history approach was developed to promote practical methods for embedding environmentally sustainable design principles into regeneration activity and the excellence of this work has been recognised at EU level. Domestic investment programmes have gained greatly from this approach and will continue to do so as it is recognised as a fundamental principle in effective programme design.

### *Obstacles faced and response taken*

As with most EU-funded programmes, key concerns have been over the need to avoid duplication and overlap in funding, as well as ensuring complementarity and value for money. There were also some initial concerns about the coherence of day-to-day management of the Programme. These issues are said to have been addressed through the development of partnership working, which has been a particular success of past Programmes and which has provided a firm base for the new Programme to 2013. The Programme has also had an ex ante evaluation which is seen as important in challenging and testing the robustness of the Programme during the course of its development. Establishing a network of local and regional facilitators has helped to shape and drive implementation and the ESTMs have kept the green economy as a central focus for the Programme.



### *Considerations for adoption in extremadura*

The key messages for Extremadura are:

- The need for partnership working in order to build institutional capacity around the green economy. Given that the lack of inter-institutional working and networking has been identified as a shortcoming in Extremadura's governance arrangements, this is an area which needs attention. The ways in which the East of England region has used the demands of EU programmes to organise around a focused green economy strategy offers an example for Extremadura;
- The key role played in EEDA's Programme by the Environmental Sustainability Theme Managers (ESTMs), who have helped to embed green economy objectives in all projects. There are lessons here in the use of dedicated individuals to network across institutions and organisations, as well as providing advice to project partners;
- The example of OrbisEnergy as a model for developments at the Scientific and Technological Park and the Iberian Centre of Renewable Energy and Energy Efficiency. OrbisEnergy acts as a regional focus for the renewable energy sector, as well as encouraging innovative activity in new firm formation and linked to skills training by a local training provider.

### *Further information*

The website for the East of England Development Agency (EEDA) is at [www.eeda.org.uk](http://www.eeda.org.uk). The Programme documents are available to download from this site. Note that the UK's regional development agencies (which includes EEDA) are in the process of being abolished and will be replaced by Local Enterprise Partnerships by 2012.

For OrbisEnergy – see [www.orbisenergy.net](http://www.orbisenergy.net)  
Lowestoft College – see [www.lowestoft.ac.uk](http://www.lowestoft.ac.uk)

## **Eco-Innovation Support through Clusters, Lower Austria**

### *Description*

The Federal State of Lower Austria has focused upon developing cross-company alliances and establishing clusters of allied companies as a key part of economic development policy. The basis of this policy is that networking between companies can improve the performance of both individual and groups of companies. The establishment of strategic alliances with other companies and research organisations is seen as bringing considerable competitive advantages

to small and medium-sized businesses. In addition, developing a network of available expertise promotes the development of new products and access to markets that might otherwise remain unattainable. For each sector management teams are established to offer support in the initial stages of building cooperation and trust between companies. These management teams offer help in identifying areas in which cooperation could be established, as well as finding potential partners, and follow the projects to a successful conclusion. Cluster managers are appointed to nurture the growth of the networks and to promote creative exchange between businesses. In order to achieve these aims, cluster managers organise workshops, cooperative funding and the development of know-how within the cluster. The intention is to develop the cluster into an expanding network where close personal and business cooperation leads to mutual benefits.

The cluster policy is the responsibility of the Ecoplus business agency, which is wholly owned by the federal state of Lower Austria. The main objectives of Ecoplus are to support businesses within the state and to develop Lower Austria as a business location. The agency provides: assistance for inward investment and company expansion, a supply of business sites, the promotion of important regional projects, and a base for encouraging inter-firm co-operation and developing cluster networks. Ecoplus is also responsible for identifying potential clusters in Lower Austria. Once this has been undertaken, the agency conducts research into the viability of potential cooperative alliances and assists in the initial phases of cluster development. Each cluster is set suitable sponsorship targets for specific identifiable cooperation projects. In this manner businesses are helped through the initial stages of cluster formation through having clear guidelines for their involvement.

To date Ecoplus has established six clusters:

- Automotive Cluster Vienna Region;
- Green Building Cluster of Lower Austria;
- Plastics-Cluster;
- Logistics Cluster of Lower Austria;
- Food Cluster of Lower Austria;
- Mechatronics Cluster of Lower Austria.

### *Relevance to Extremadura*

Two specific clusters within Lower Austria have relevance for Extremadura – the Green Building and Food Clusters. Lower Austria is similarly dominated by SMEs, although here these are increasingly engaged in joint vocational learning and innovation.

## Green Building Cluster

The Green Building Cluster of Lower Austria shows how a region can position itself around a future industry and thus improve its own competitiveness. The Green Building Cluster is dedicated to energy-efficient refurbishment of older buildings, the construction of new, multi-storey buildings to passive house standards, healthy interiors, and enhanced living comfort. These activities are being expanded to encompass the related fields of renewable energy and environmental technology. The Cluster currently has about 200 Cluster partners and forms a network linking business and research and characterized by innovation and cooperation. The overall aim of the Green Building Cluster is to link and strengthen existing Lower Austrian competencies in the area of sustainable building and living. The cluster team is comprised of experts who are professionals with experience in innovative collaborative projects, technology transfer in R&D projects and in project management. They provide information, support and advice to all Cluster partner companies for all types of building products and methods.

The Cluster aims to link existing strengths with new ideas and innovation, with research activities at universities, research institutions and higher technical schools. It has invested resources not only in the innovation-related activities of leading industrial companies, but has also developed training and qualification measures directed at SMEs, architects, mechanical service engineers, plumbing and heating professionals, carpenters and other tradespersons. For example, heating specialists are trained in the installation of ventilation systems with heat recovery for passive houses; master builders and architects are instructed on new renovation methods using passive house technologies; professional skills have been developed for old building refurbishment. These activities form the foundation for new cooperation and research projects among the diverse target groups. The Cluster is also in charge of the large local market for old building refurbishment. Here, comprehensive courses in old building refurbishment are offered to companies, followed by the assembling of bidding consortia in cooperative groups and assistance in gaining access to markets.

## The Food Cluster

The Food Cluster of Lower Austria is currently less well developed than the Green Building Cluster. It was created as a project platform for the support of the local food industry – from agriculture to processing through to food retailing and has four main objectives:

- the production of high quality and safe products;
- the development of innovative food processing techniques;

- the use of novel food technologies;
- marketing regional and organic food products.

Projects have been developed by cluster managers in cooperation with local companies, mainly in the areas of food quality and safety, but also for the development and promotion of organic and regional food products. In the case of the latter, the rationale for this focus is that “demand for organic products continues to increase. Regional products are also gaining in popularity thanks to their short route to market and the creation of value which remains in the region” (*www.ecoplus.net*). One project has been focused on streamlining of food traceability systems across the entire production chain in order to make regional food components identifiable to consumers. This has not only helped reduce transportation costs, but has also reinforced a sense of regional identity. The joint development of new, innovative products and processing systems is also encouraged with the aim of making firms internationally competitive. In a similar manner to the Green Building Cluster, the Food Cluster has developed training and qualifications related to current topics and issues in the food industry.

### *Results of the approach*

The development of clusters in Lower Austria demonstrates that dynamic cluster initiatives which focus on the right topics can make a real difference in encouraging innovation. The cluster policy has enabled companies to work together to their mutual benefit and has linked this to a wider state-level innovation policy which is focused on green economy innovations.

### *Reasons for success*

Central to the success of the eco-innovation policy has been the role of Ecoplus acting as the interface between higher levels of state government and private sector partners. As the business agency of Lower Austria, Ecoplus has close relations with regional policy makers and has been able to influence the existing policy framework in the province proactively. It is a one-stop-shop for business activities in the region and provides businesses with information regarding potential market and collaborative opportunities. It has become customary for policy makers to consult with Cluster management, thus enabling a positive influence on economic and innovation policies. On the other hand, the Cluster team is also closely involved with companies and other stakeholders and can thus assume the role of an effective bridge between public administration and companies. With the success of Ecoplus in recruiting substantial numbers of companies to the Clusters, the agency has subsequently been able to devote more effort and resources towards expanding R&D+I activities within the region.

### *Obstacles faced and response taken*

The evidence on Lower Austria's Cluster and eco-innovation policies provides little detail of the specific problems encountered. However, a broader set of factors have been identified in Austria which inhibit companies engaging in innovative activities. These include:

- reduced spending on training, with a particular decline in apprenticeships and vocational training;
- a lack of competitive attitude, with competitiveness achieved through mergers and increased company size, rather than by innovation, competition and business creation;
- the concentration of new firm formation in traditional sectors, rather than new industries;
- the role of Austria's social system, based on employment, stable labour conditions and family relationships, which may not provide enough safeguard at a time of increasing flexibility and mobility;
- low levels of productivity and a general lack of flexibility and mobility.

### *Considerations for adoption in Extremadura*

Extremadura already possesses 14 clusters established by the regional Ministry of Economics, Commerce and Innovation to encourage innovation and R&D. The example of Lower Austria indicates how such cluster development can be linked to a broader regional innovation strategy and more specifically to the greening of innovation activities. In both cases, these are sectors where Extremadura already has an important presence, but where a clearer focus upon the green economy agenda and eco-innovation could lead to substantial benefits. The Green Building Cluster's work on energy-efficient old building refurbishment and the Food Cluster's focus on organic and regional foods offer examples of what could be achieved through greater networking, cooperation and partnership within Extremadura.

### *Further Information*

For details of Ecoplus and details of the individual clusters see: [www.ecoplus.at/ecoplus/e/default.asp](http://www.ecoplus.at/ecoplus/e/default.asp)

Regional Innovation Strategy website: [www.ris-noe.at/engl/index.htm](http://www.ris-noe.at/engl/index.htm)

## Green Public Procurement Policy, London (UK)

### *Description*

Green Public Procurement (GPP) is defined in EU Communication (COM (2008) 400) as “a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured.” The potential impact of GPP comes through the scale of spending by public authorities – for example, within Europe approximately 2 trillion Euros are spent annually, equivalent to around 17% of the EU’s GDP. Public authorities can focus this purchasing power on sourcing those goods and services which have a reduced environmental impact and which contribute to Europe’s overall strategy for sustainable consumption and production. Public procurement can shape production and consumption trends and a significant demand from public authorities for “greener” goods will create or enlarge markets for environmentally-friendly products and services. Within some sectors, public purchasers command a large share of the market (*e.g.* public transport and construction, health services and education) and their purchasing decisions can have major impacts.

As well as the direct effect of GPP, such purchasing strategies are also intended to influence the market and the private sector. By promoting and using GPP, businesses are provided with incentives to develop environmental technologies and green products. Promoting green procurement thus provides important incentives for industry to develop ‘green’ technologies and products and promote them in the market place. Small- and medium-sized companies may be particular beneficiaries of GPP, as it provides them with a market opportunity to for their innovative solutions and products.

Key factors which promote the adoption of green public procurement include:

- Strong political drivers, national guidelines and programmes for GPP
- Public information resources via a website and eco-labels;
- Use of innovative tools like life-cycle thinking and green contract variants in procurement procedures;
- Implementation of environmental management systems (EMS) by the purchasing authorities.

### *Relevance to Extremadura*

While the Junta de Extremadura is keen to encourage the development of a regional green economy, it is clear that efforts to do so are fairly piecemeal and uncoordinated. Moreover, the Junta needs to provide a clear lead to the development of green economy sectors and to demonstrate leadership within the region. One way in which the Junta could do so is by adopting a green purchasing policy for its own transactions. Some guidance on this is provided by the example of GPP policies in London. Policy makers in Extremadura should explore in more detail the criteria that should be developed locally for GPP. In doing so, they can draw upon the London example, but there are numerous other examples that can be drawn on from across the EU (see [www.iclei-europe.org/topics/sustainable-procurement/](http://www.iclei-europe.org/topics/sustainable-procurement/) for details and resources).

In London a Responsible Procurement Policy has been developed to ensure that the Greater London Authority (GLA) group's annual spend of over GBP 3 billion is spent in accordance with a GPP. The GLA group has defined responsible procurement as: “the purchase of goods, works and services in a socially and environmentally responsible way that delivers value for money and benefits to the contracting authority and to London”. The Responsible Procurement Policy consists of seven themes:

1. encouraging a diverse base of suppliers;
2. promoting fair employment practices;
3. promoting workforce welfare;
4. addressing strategic labour needs and enabling training;
5. community benefits;
6. ethical sourcing practices;
7. promoting greater environmental sustainability.

### ***Results of the approach***

The GLA claims that it has achieved significant benefits to be gained from responsible procurement, including the following;

Environmental benefits:

- Reduced emissions and waste generation, resulting in improved air and water quality;
- Reduced use of natural resources;
- Reduced environmental impact of firms' operations;

- Meeting existing and forthcoming legislation around the climate change agenda;
- Supporting resource efficiency.

Social benefits:

- Improvements in working conditions – labour standards, health and safety;
- Assisting disadvantaged groups in society;
- Improved wage rates for those in low pay;
- Improving the skills of the workforce.

Economic benefits:

- Improved efficiency in the public sector;
- Improved efficiency and transparency of procurement procedures and structures;
- Financial savings;
  - Through the concept of whole life costing some sustainable products and services reduce cost over their full life cycles
  - Improved bottom line – avoiding the need to pay for: resources which are turned into pollutants; the cost of cleaning them up; the cost to health and welfare systems arising from increases in illnesses caused by pollution.
- Stimulates the market for green technologies and generates new employment opportunities.

Allied to the Responsible Procurement Policy is the Mayor of London's Green Procurement Code which acts as a support for organisations committed to reducing their environmental impact through purchasing policies. Results from London indicate that the highest levels of expenditure are on: construction, repair and maintenance; environmental services; building construction materials. However, the greatest numbers of purchases are made in the lower value categories of: stationery; cleaning and janitorial; catering.

### *Reasons for success*

The Green Procurement Code involves not just advice and support to organisations about purchasing policies, but combines this with performance benchmarking, the sharing of best practice and recognition for achievements in implementation – organisations can achieve gold, silver or bronze status.



Participants have access to an on-line progress review, a self-assessment tool that helps participants move through the stages of green procurement and to keep a record of their activities. This helps participants observe those areas where they are performing well and those where they can improve.

### *Obstacles faced and response taken*

Potential barriers identified in London included budgetary constraints, the failure to implement whole life costing, the split between management of operation and capital budgets, and uncertainty on how to take account of non-monetary benefits. These have been addressed through developing a clear commitment to the process from the top of local government, setting clear priorities for action and through building capacity to act – the latter has been enhanced by encouraging organisations to benchmark their own capabilities. Findings from other studies of GPP also identify several barriers for an increased use of GPP. These include the perceived higher costs of green products and a lack of environmental information, knowledge and training, as well as weak managerial and political support – again, it is vital therefore that any GPP policy has the strong backing of the relevant government institutions at the highest level (Steurer, Berger, Konrad and Martinuzzi, 2008).

### *Considerations for adoption in Extremadura*

The adoption of green public procurement offers considerable opportunity in Extremadura to drive forward the green economy agenda and to encourage innovative behaviour in the private sector. Two specific sectors where attention could initially be directed are energy and construction. The renewable energy sector is obviously a key focus within the region as evidenced by the Iberian Centre of Renewable Energy and Energy Efficiency, the STP, the ICENER programme and the Energy Cluster. The Junta de Extremadura should set targets for its own electricity to come from renewable sources and thus provide both a tangible lead for the sector's development and an additional market. Similarly, the construction sector is already a focus for some youth training programmes and this could be given added weight if the Junta's own construction and rehabilitation projects included green criteria within purchasing contracts. If national building code legislation allows, this could also offer opportunities to encourage the adoption of traditional building techniques which may be more energy efficient and labour intensive than current conventional techniques.

### *Further Information*

EU policy on green public procurement: [http://ec.europa.eu/environment/gpp/index\\_en.htm](http://ec.europa.eu/environment/gpp/index_en.htm)

London's Responsible Procurement programme [www.london.gov.uk/rp](http://www.london.gov.uk/rp)

Case study examples of the RP programme [www.london.gov.uk/rp/casestudies/](http://www.london.gov.uk/rp/casestudies/)

Mayor of London's Green Procurement Code [www.greenprocurement-code.co.uk](http://www.greenprocurement-code.co.uk)

## Notes

1. The state of Colorado defines green jobs focusing on renewable energy (RE) and energy efficiency (EE) sectors. This encompasses all aspects of renewable energy and energy efficiency, and includes both the direct and indirect jobs created in both these sectors.

A job in the RE industry consists of an employee working in one of the major RE technologies included in this study – wind, photovoltaics, solar thermal, hydro-electric power, geothermal, biomass (ethanol, biodiesel and biomass power), fuel cells and hydrogen. In addition, in this study, jobs in RE include persons involved in RE activities in the federal, state and local governments, universities, trade and professional associations, non-governmental organizations, consultants, investment company analysts, etc.

A job in the EE industry consists of an employee working in a sector that is entirely part of the EE industry, such as an energy service company or the recycling, reuse and remanufacturing sector. It also includes some employees in industries in which only a portion of the output is classified as within the EE sector, such as household appliances, heating, ventilation and air-conditioning (HVAC) systems, construction, etc. Finally, in this study, jobs in EE include people involved in EE activities in the federal, state and local governments, universities, trade and professional associations, non-governmental organizations, consultants, investment company analysts, etc.

2. More information at : [www.technifutur.be/tnk/default.asp](http://www.technifutur.be/tnk/default.asp).

## *Annex B*

### **Analysis of the surveys**

#### **Analysis of the survey for businesses**

In this section the different data from the questionnaire for companies conducted in Extremadura is analysed, in which companies from all over the community have participated. **70 companies** completed the survey. The questions are included at the end of this section.

#### *1. Type of company*

##### *1.1 Main service offered by the company*

As Figure 5 shows, the companies come mainly from the raw materials sector (mostly fruit and vegetable products), making up 22.4% of the responses, followed by processing companies. This proportion is a good representation of the population of Extremadura.

As can be seen, Extremadura is characterised by being a region with a strong rural legacy. The growing demand for raw materials from Extremadura has led to a strong presence of the region's products in the markets of other autonomous communities of Spain.

Service companies represent 9% of the total in the sample. In the provincial capitals, Cáceres and Badajoz, this figure increases to up to over 30%. The percentage of small hotels is also very representative, making up 14.9% of the total.

The sale of products is, however, gaining a leading position in Extremadura, representing 13.4% of the total, due to the growth in commercial activity that is occurring in both provinces of Extremadura. The establishment of new shopping and leisure centres, combined with the restoration of the old quarters in the cities have enabled this positive evolution in trade in Extremadura.

Figure 5. **Business: main product or service**

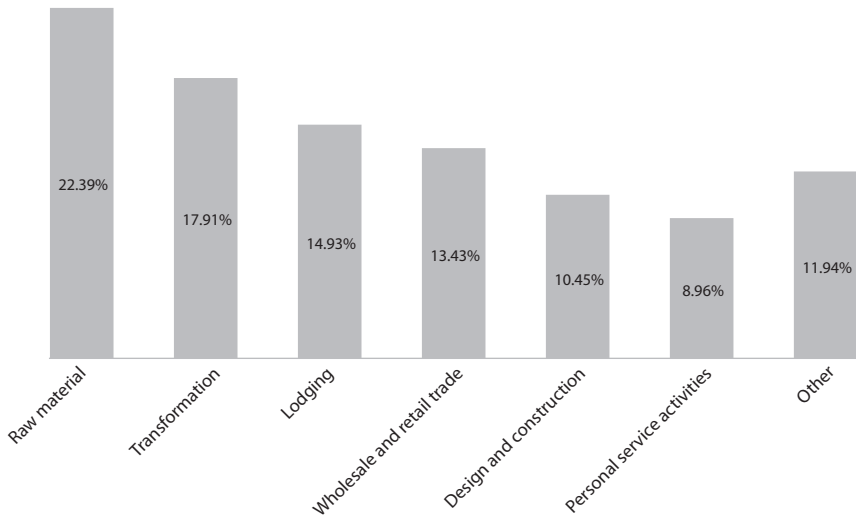
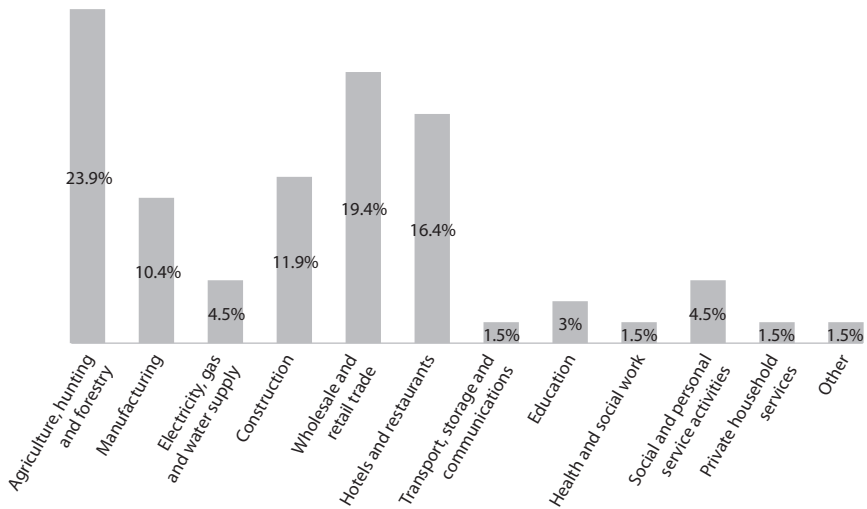


Figure 6. **Business: main sector of activity**



From the information above it can be concluded that, despite having a considerable raw materials production sector, most of the activities in the region continue to be those related with the services sector in general.

### *1.2 Operating sector of the participating companies*

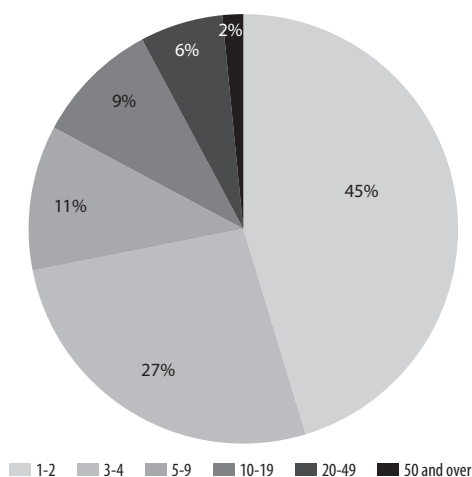
As Figure 6 shows, the main sector of activity of the companies surveyed is agriculture (23.9%), followed by trade and sales. As already noted earlier, Extremadura is characterised by being a rural region. Although the activities of most of the companies are related with the services sector, the product offered by these is still related with the primary sector.

After agriculture, the second sector within which the participating companies most work is that of wholesale and retail trade, making up 19.4%. This is due to the significant increase in shopping centres in the region in the last decades.

### *1.3 Number of workers per company*

The average number of workers in the companies surveyed is 7.19 workers per company. This is a high average figure bearing in mind that the average in Spain is 1.6 workers per company, due to the predominance of self-employed workers. This might be why the mode of the sample is 1 employee, which means that we are mostly dealing with private business people (entrepreneurs) who have set up their own business. Figure 7 shows the number of workers in the companies surveyed.

**Figure 7. Number of workers in the companies**



The asymmetry of the chart reflects the fact that the big majority of the enterprises are very small (1-2 workers), which means either a family business or self-employed. According to the OECD criteria, the small businesses (1-9 workers) in Extremadura represent almost 83% of the overall business population.

## 2. Companies and climate change

This second part of the survey measures the companies' attitude to climate change, not just the direct impact (environmental), but also that of the "green" policies or regulations enacted. It shows that, despite the efforts made, there are still many difficulties when it comes to putting environmentally friendly measures into practice.

### 2.1. Changes or adjustments due to climate change

The questionnaire asked the participating companies if they had made any changes in the last 12 months in relation to the introduction or modification of products or services to adapt to climate change. As shown in Table 13, only 30.3% of the companies who participated in the questionnaire said they had made changes related to the adaptation to climate change over the last 12 months. 69.7% had not made any changes in relation to climate change in this period.

Table 13. **Changes or adjustment in the past 12 months**

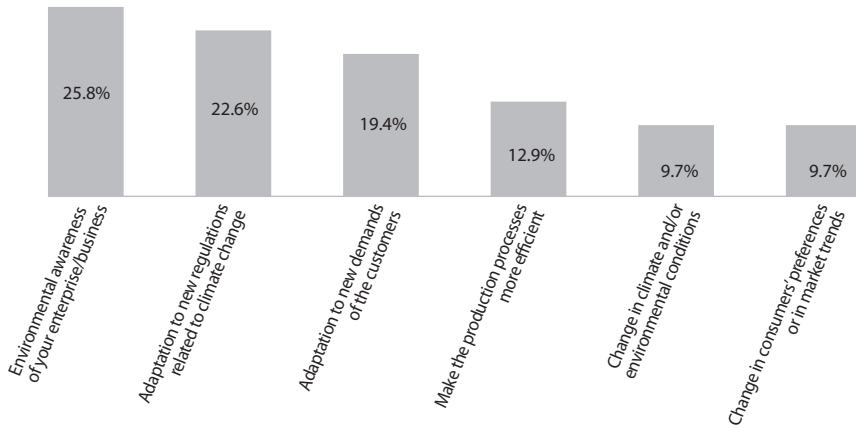
	Frequency	Valid percentage
No	46	69.7%
Yes	20	30.3%
Total	66	100%

Companies in Extremadura are characterised by their traditional and family profile. This kind of company, normally small sized, comes up against certain difficulties when it comes to adapting and putting environmentally friendly methods into practice.

### 2.2. Reasons for carrying out these changes

Figure 8 shows that, among the companies who said they had carried out these changes, they confirmed having done so due to greater environmental awareness (25.8%), followed by a better fulfilment of the existing regulations (22.6%). Changes related to consumer preferences and climate change each represents 9.7%.

Figure 8. Reasons for carrying out these changes



### 2.3. Effect of the changes on employment in the companies

Employment changes linked to the impact of the adaptations of the companies to climate change are minimal. Only 32.9% of the companies surveyed had made changes or adjustments, and these had not had a significant effect on employment. Furthermore, there was no impact on employment in 78.3% of the companies who said they had carried out changes related climate change. Finally, it should be added that only one company had lost one position due to these changes.

### 2.4. Employment created after the changes undertaken

The jobs created confirm the previous question. Only three companies have created jobs (two of these two positions and one of them four). These figures are not statistically significant and no conclusions can be drawn on this matter.

### 2.5. Qualifications for those jobs created

Given that the data for the previous response isn't significant the frequencies of the variables for the qualifications required for the new jobs cannot be analysed.

### 2.6. Changes that have led to differences in the work profiles

The changes have caused very little difference to the work profiles. Only 11.4% of all the work profiles have undergone some kind of adjustment or change as the result of changes within the companies.

### *3. Climate change and training*

#### *3.1. Training offered in the last 12 months*

Nowadays organisations consider training to be one of the fundamental pillars to obtain competitive advantages. Therefore, the demand for training initiatives has increased in recent years. Training including “green economy” elements has followed the same trend. Training in aspects related to the “green economy” generates greater environmental awareness in workers and allows companies to increase their social responsibility. The basis for this new awareness is highly related to the constant introduction of regulations to protect the environment and the huge amount of media attention given to this issue.

From the companies surveyed, 51.6% said they had not offered any kind of training in the last 12 months, as against 48.4% of the companies who said they had carried out training activities. In this instance it can be seen that there is a very even split between both responses.

#### *3.2. Areas of training offered*

Of the 30 companies who offered training to their employees in the last 12 months 61.7% have offered temporary, rather than continuous training. Only 17% of the training had any kind of continuity. Statistical analysis shows the huge distribution of answers to this question is not significant.

#### *3.3. Reason for carrying out training on developing green skills*

Without being statistically significant the results of the study allow it to be affirmed that most businesspeople (50%) who undertake training in the so-called “green skills” do so to anticipate a need which, with all certainty, will arise in the future. This attitude is the result of a growing social awareness. Together with this result it can be seen that legal requirements also influence training related with the green economy (33.3%). The companies that replied that they undertook training just to exploit the opportunity for state training were in the minority, in this instance, only 16.7%.

#### *3.4. Way in which the training was provided*

28% gave continuous training, mainly specific training during working hours.

As regards when the training was given, of the companies who used **full time training**, 8 gave training during working hours and 6 outside normal working hours.



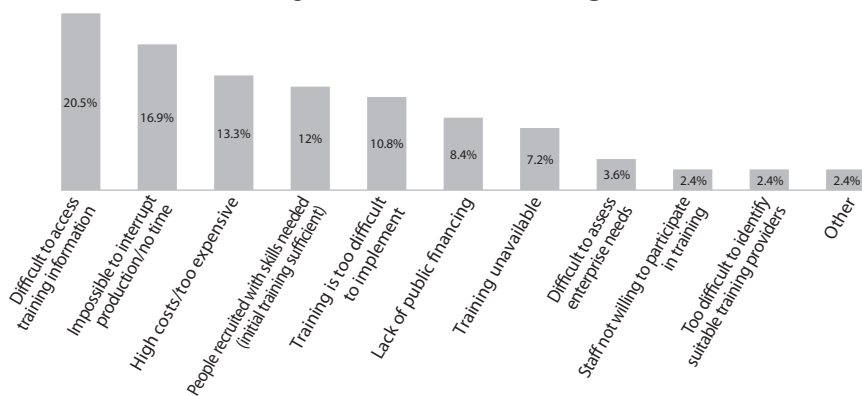
As regards when the training was given, of the companies who used **part time training**, 11 gave training during working hours and 2 outside normal working hours.

### 3.5. Reasons for not carrying out any training

All the companies who did not carry out any training activities said there were barriers or obstacles to doing so. As Figure 9 shows, the main barrier to training is the difficulties stated by the companies in accessing information about the training available (20.5%). Otherwise, 16.9% of the total stated that they could not stop production for training. As has been noted before, most of the companies in Extremadura are SMEs, in which access to information is quite limited. The small size of the companies also means that they find it difficult to stop the production process to give workers time for training.

It is interesting to note that only 8.4% of the companies do not carry out training due to a lack of funds. At present all the companies have their own funds for training, however, they do not know whether or not dividing these funds between workers is egalitarian. It can also be seen that, in general, workers show an interest in training, given that only 2.4% show a lack of interest.

Figure 9. **Barriers to training**



## Conclusions

The general conclusions from the analysis of the survey of companies in Extremadura are:

1. The companies that took part in the study are representative of the reality in Extremadura, which is dominated by the primary, fruit and vegetable and raw material processing sectors. A third of the

responses come from the agricultural sector. Most of the services offered by companies in Extremadura correspond to the primary sector, due to this sector's long tradition and importance in the region.

2. A quarter of all the companies have **only one full time worker** (normally the owner, the entrepreneur). As the number of employees goes up the distribution of the sample also increases.
3. Only a third of the companies have made changes related to the adaptation to climate change over the last 12 months. Two thirds of these **have not made organisational changes** related to climate change in this period. This is due to the difficulties small companies have in accessing information and the impossibility of giving their workers time to receive training.
4. The institutions surveyed show more interest in environmental awareness than the companies, who act more due to the new regulations regarding processes and efficiency than due to environmental awareness.
5. The companies that undertake training in the so-called “green skills” do so to anticipate a need which, with all certainty, will arise in the future. Another reason why companies get training in green economy is related with fulfilling the new regulations to protect the environment. Little training has been given in “green skills”.

### *Questionnaire for businesses*

**A.** What is the *main* service or product that offers your enterprise? [single response]

- |   |                          |
|---|--------------------------|
| Food                                      | <input type="checkbox"/> |
| Raw material trade ( <i>e.g.</i> wood)    | <input type="checkbox"/> |
| Process products ( <i>e.g.</i> furniture) | <input type="checkbox"/> |
| Persons service ( <i>e.g.</i> nursery)    | <input type="checkbox"/> |
| Retailing ( <i>e.g.</i> grocery store)    | <input type="checkbox"/> |
| Design and building (housing)             | <input type="checkbox"/> |
| Others (specify)                          | <input type="checkbox"/> |

**B.** What is the main sector your business operates in? [single response]

- A. Agriculture, hunting and forestry
- B. Fishing
- C. Mining and quarrying

- D. Manufacturing
  - E. Electricity, gas and water supply
  - F. Construction
  - G. Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
  - H. Hotels and restaurants
  - I. Transport, storage and communications
  - J. Financial intermediation
  - K. Real estate, renting and business activities
  - L. Public administration and defence; compulsory social security
  - M. Education
  - N. Health and social work
  - O. Other community, social and personal service activities
  - P. Activities of private households as employers and undifferentiated production activities of private households
  - Q. Extraterritorial organisations and bodies
- C. How many employees does your business have (equivalents in full time)? (approximately) \_\_\_\_

### ***Impact of climate change in the labour market***

**Q 1.** Has your business made changes in the past 12 months in terms of introducing a new product/service/operation due to climate change adaptation or mitigation?

**[Mitigation:** mitigation includes all measures taken to reduce negative impacts of human activities on the environment and is achieved by reducing both the energy intensity of GDP and the carbon intensity of energy used (OECD, 2008a, p. 11)<sup>1</sup>.

**Adaptation:** adaptation consists in deliberate actions undertaken to reduce the adverse consequences [of climate change] as well as to harness any beneficial opportunities” (OECD, 2008b, p. 1).<sup>2</sup>

**NO**  (ir a la Q 2)    **YES**

If the answer to Q 1 is **YES**

**Q 1.1** What are the main reasons for those changes? [choose all the appropriate]

- Change in climate and/or environmental conditions
- Change in consumers' preferences or in market trends
- Adaptation to new demands of the customers
- Adaptation to new regulations related to climate change
- Environmental awareness of your enterprise/business
- Make the production processes more efficient

**Q 1.2** Have these changes resulted in the creation, suppression or transformation of jobs in your enterprise?

- Job creation
- Job suppression
- Job transformation
- No impact [go to Q 2]

**Q 1.2.1** If it has led to the **CREATION** of jobs:

- How many jobs have been created in the last 12 months as a result?  
\_\_\_\_\_
- What kind of skills do you need for these new jobs? [one response per line]

Skills	High need	Some need	No need	Don't know
<b>Generic</b> – oral communication, written communication, numeracy and literacy, office admin skills, general IT user skills;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Routine</b> – repetitive, more basic, low knowledge intensive skills;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Técnicos/avanzados</b> – capacidades que requieren la resolución de problemas; diseño, operación, replanteamiento o mantenimiento de maquinaria o estructuras tecnológicas; habilidades profesionales en informática;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Management</b> – skills for business planning, regulations and quality control, human resources planning (recruitment, training and skills development) and allocation of resources;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Social</b> – motivation and appreciation of people’s characteristics for individual and team working purposes, customer handling; appreciation of networks and value-chain partners;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Language and cultural</b> – ability to communicate in more than one language, appreciation of cultural characteristics of different ethnic groups;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Entrepreneurial</b> – specific skills for start-ups such as risk, strategic thinking, self-confidence, the ability to make the best of personal networks and the ability of dealing with challenges and requirements of different nature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Green</b> – specific skills required to adjust your products, services or operations due to climate change adjustments, requirements or regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Other</b> – please specify				

**Q 1.2.2** If it has led to **TRANSFORMATION** of the job profiles:

Have these changes resulted in the need to upgrade the skills of your workers or to train them?

**NO**       **YES**

**Q 2.** Did you or your workers participate in a training over the past twelve months to meet new skills needs in your enterprise?

**NO**  (go to Q 3) **YES**

If the answer to Q 2 is **YES**

**Q 2.1** Please indicate which of the following areas of training: [one response per line]

<b>Industry training/VET</b>	Did not do	One-off (specific need)	Regularly (Weekly/monthly)	Don't know
Business planning (including management and leadership training)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing and promotion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research (including market research) and product development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Accounting and finance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information and Technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legal courses (IP, patents etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E-Commerce	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisational Health and Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Job-specific technical training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language courses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social skills development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entrepreneurship related training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green skills development (green skills are specific skills required to adjust your products, services or operations due to climate change adjustments, requirements or regulations) <b>if yes → go to Q 2.1.1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Other (specify):**

[End of Q 2.1 go to Q 2.2]

**Q 2.1.1** If you have undertaken training in the area of green skills development, what was the reason? [multiple responses]

- New regulation or legal requirement
- Training anticipating a future need
- Adjust to new products/services that already exist in the enterprise
- Take advantage of a public training programme/training support scheme
- Other (specify)

**Q 2.2** How was the **training** provided? [one single response per line]

<b>Provision of vocational &amp; educational training (VET) programmes &amp; courses</b>	All the time	Most of the time	Never	Don't know
On-the-Job (during working hours)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Off-the-job (training away from the individual's immediate work position, whether on your premises or elsewhere)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Within the firm (in-house)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outside the firm (e.g. at an external training provider)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
By accredited trainers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Providing formal (nationally recognised) qualifications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)				

[End of Q 2.2 go to Q 3]

If the answer to Q 2 is **NO**

**Q 2.4** What were the reason(s) that you did not carry out a training? [multiple responses]

<b>Barriers to training</b>	
Training unavailable	<input type="checkbox"/>
High costs/too expensive	<input type="checkbox"/>
People recruited with skills needed (initial training sufficient)	<input type="checkbox"/>
Lack of public financing	<input type="checkbox"/>
Impossible to interrupt production/no time	<input type="checkbox"/>
Difficult to assess enterprise needs	<input type="checkbox"/>
Staff not willing to participate in training	<input type="checkbox"/>
Training is too difficult to implement	<input type="checkbox"/>
Risk of poaching after training	<input type="checkbox"/>
Too difficult to identify suitable training providers	<input type="checkbox"/>
Too difficult to access training (location; availability at a suitable time)	<input type="checkbox"/>
Other barriers (please specify)	

**Q 3** Do you consider any of the activities below to be better sources of learning for staff than formal education and training courses? Please differentiate between high-medium and low skilled employees. [Multiple response per line, except for “don’t know”]

<b>Activities</b>	Better for staff which are...		
	High-medium skilled	Low skilled	Don't know
Business planning (including management and leadership services, consultancy and advice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing and promotion services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research (including market research) and product development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accounting and finance services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information and Technology services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human Resource services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legal advice and services (IP, patents etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E-Commerce ( <i>e.g.</i> on-line work with clients and suppliers; access to web-based information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisational Health and Safety advice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Job-specific technical activities ( <i>e.g.</i> advice on utilisation of new plant or equipment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language or communication coaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social skills development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entrepreneurship related activities ( <i>e.g.</i> brainstorming about opening new markets or new range of products and services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green skills development ( <i>e.g.</i> co-operation with other organisations to find ways to adjust production to minimise climate change impact)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)			

## Analysis of the survey for institutions

In this section the different data from the questionnaire for institutions conducted in the autonomous community of Extremadura is analysed, in which **52 institutions and organisations** in this community participated.

### *1. Type of institution that participated in the study*

#### *1.1. Participating institutions*

98.1% of the participating entities are local, mostly Local Development Offices or Agencies, belonging to the local or regional Administration. According to data from the National Statistics Institute (2009) the public sector in Extremadura contributes 24% of the total regional GDP, which represents an important part of Extremadura's economy.

#### *1.2. Services offered to companies in Extremadura*

The participating institutions offer different services to companies in the region. Most of the activities these institutions carry out are related with processing the aid offered related to employment (82%). There are no responses in the instance in relation to R&D+I or aid for investment. The participating institutions specialise only in aspects related with employment.



### *1.3. Funding of the institution's main activity*

From the participating entities, 51.9% are mainly funded by funds from the Regional Government of Extremadura, followed by 38.5% who are funded by European public funds. Only 3.8% are funded by other funds, which could be local or even private. It is important to stress that it was not specified whether the funds from the Regional Government of Extremadura are, in turn, European or part of the respective annual budgets of the Autonomous Community.

## *2. Impact of climate change on the job market*

This second section of questions analyses in depth whether there have been changes or adjustments in the participating institutions, as well as the commitment to factors such as training, attention to the so-called “green demand” and other issues related to employment and the green economy.

### *2.1. Existence of changes or adjustments in the last twelve months to adapt to climate change*

Participants were asked whether the Institution had made any changes or adjustments in the last 12 months to adapt to climate change, regarding the introduction or modification of products, services or operations. 39.6% of the participants said they had made these changes, as against 60.4% who said they had not made any modifications in the last year.

### *2.2. Reasons to carry out these changes*

The institutions which said they had carried out changes (a total of 19, equivalent to 39.6%) were offered a list of different reasons<sup>3</sup> for implementing these changes. Figure 10 shows that 35% of the institutions which had carried out changes did so due to environmental awareness, followed by 18.5% which had done so for the efficiency of their processes. Only 1.9% of the responses of changes entailed a need to increase operating costs. Most of the institutions which made changes towards a green economy did so for environmental awareness and efficiency in their processes.

### *2.3. How these changes have been funded*

The participating institutions were asked how these changes had been funded, through a range of possible responses. As Figure 11 shows, analysis of the results indicates that in 33.3% of cases funding came from additional funds and 30% of the organisations made adjustments without additional changes to their general budget. 10% of the organisations said the changes were made without additional costs in their budget.

The relation between the reasons for making changes and their funding did not produce any significant result.

#### 2.4. Need to increase the training of the organisation's staff

This time it was asked whether the changes made by the people who had replied yes to the previous questions had resulted in a greater awareness about training and improving the skills of the people who work in the institution. 42.9% of the organisations which had made changes responded

Figure 10. **Reasons for changes**

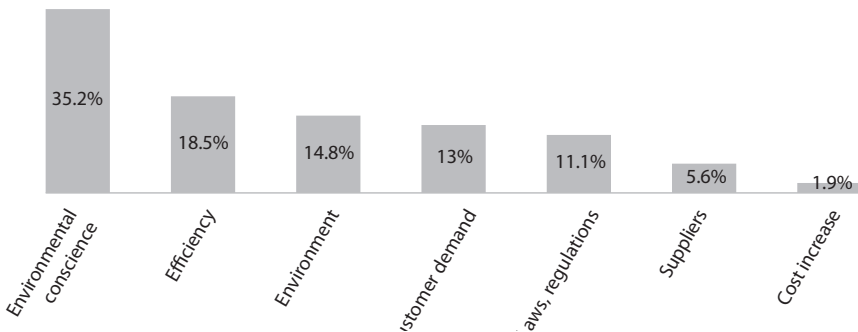
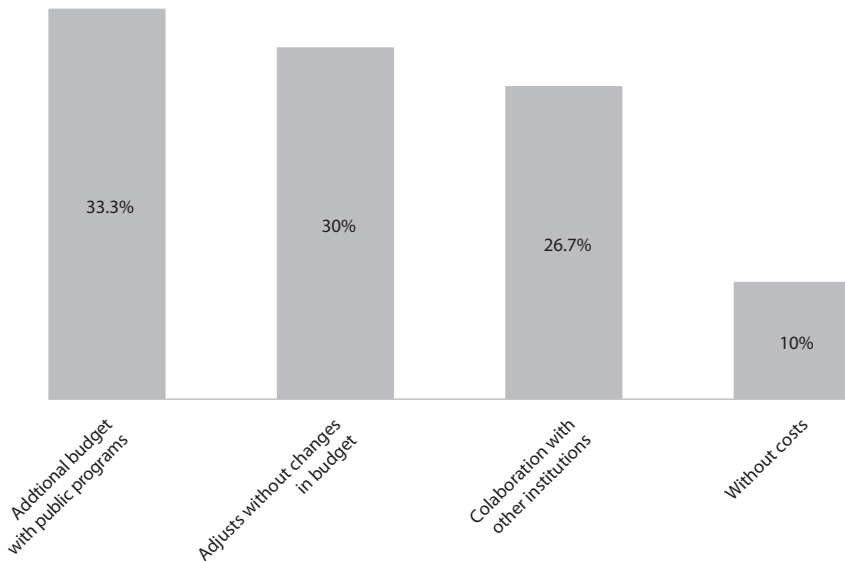


Figure 11. **How these changes have been funded**



that they did perceive the need to increase staff skills, as against 57.1% which considered they did not need any staff training.

### *2.5. Training given by the organisation’s workers*

The last question in this section was whether the collaborators of the institution had participated in any training activity in the last 12 months. As can be seen, this question addressed the institution’s attitude towards training. 60% of the collaborators of the institution had participated in training activities that could have improved their skills and abilities in the last 12 months.

## **3. The “green demand” and the lack of training**

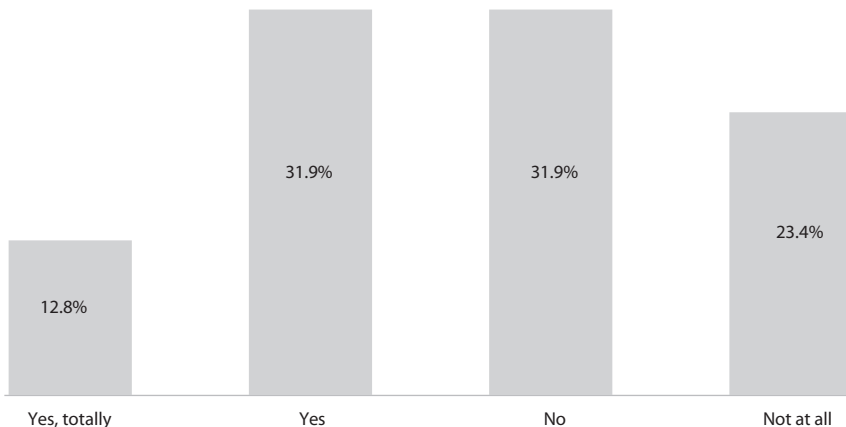
This section measures the reality of the institutions. The section seeks to establish what are the areas of improvement of the institutions that have still not undertaken training in these topics.

### *3.1. Meeting the “green demand” for products or services*

Participants were asked whether they thought the products or services the institution offered met users’ emerging “green” demands. The responses were varied and no clear conclusion can be drawn, although there is a certain trend towards “no” as Figure 12 shows.

It is interesting to note that if these responses are analysed according to the need to improve skills through training (question 2.4) we can say that there is a relationship between both questions. A comparison of averages

Figure 12. **Do your services meet the demands?**

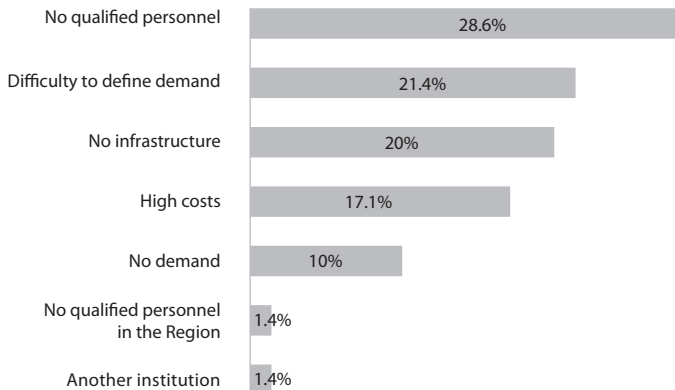


produces a highly significant result at the 95% confidence level: the more the products/services meet the needs of the green demand, the less need there is thought to be to increase skills.

### 3.2. *Reasons why services do not meet the “green demand”*

This question inquires about the reasons why the services do not meet the demand. Figure 13 shows that 28.6% of the responses prove that there is no qualified staff in the organisations. This lack of qualified staff enables us to conclude that training could be one of the ways to improve the organisations. It is followed by 21.4% of the institutions which have difficulties defining the demand. Lack of infrastructure, at 20%, is another of the reasons for the failure to meet the green demand.

Figure 13. **Reasons for not meeting the demands**

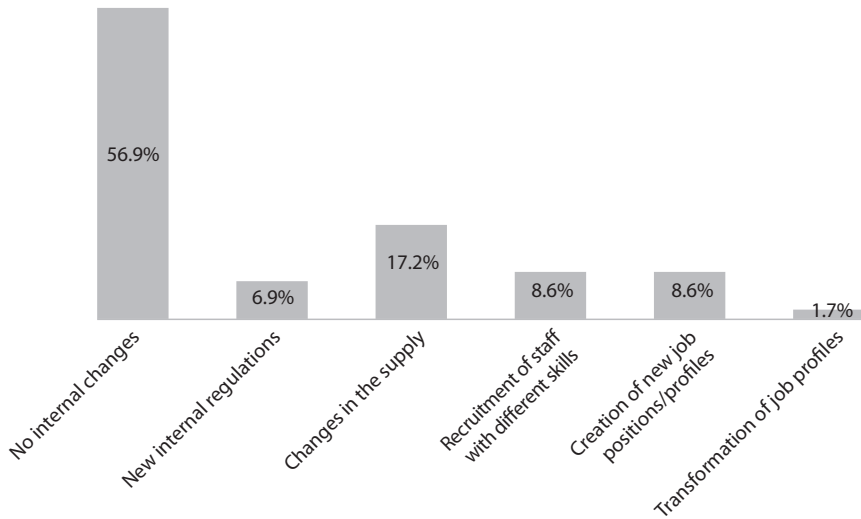


### 3.3. *Changes in the institutions*

The existence of internal changes to adapt to the new realities and environments generated by climate change is the last question in the questionnaire. One or several responses were possible to the question: “What internal changes have there been in the institution’s structure to adapt to the new needs of climate change?”

The frequency of multiple responses to the questions produced the results shown in Figure 14, in which 56.9% admitted there had been absolutely no changes. After this result, the highest percentage was related to the distribution chain and, in particular, suppliers.

Figure 14. Changes in the institutions



### ***Conclusions***

From the above, the following conclusions can be drawn from the questionnaire for institutions:

1. In the last year over 60% of the institutions which took part in the study did not make any changes related to climate change. Of those that had made changes most had done so for subjective reasons: raised environmental awareness.
2. Most of the changes made were funded with additional funds, that is to say, funds not established in the original budgets.
3. There is no qualified staff in the organisations nor is there a suitable system to identify the demand in order to tackle such changes.

### ***Questionnaire for institutions***

**A.** What kind of institution do you work in? [single response]

Public employment office

Local entity (e.g. local development agency)

- Training centre
- Higher education institution
- Technology park
- Business association
- Others (specify)

**B.** What is the main product or service that offers your institution to Extremadura enterprises? [single response]

- Human Resource qualification
- Identification of new markets/R&D+i
- Assistance with employment creation/support to apply for investment schemes
- Facilitate hiring procedures
- Others (specify)

**C.** What is the main source of financing of the core activity of your institution? [single response]

- Public National funds
- Public State funds
- Public City funds
- Private funds (grants, shareholders)
- Others (specify)

***Impact of climate change in the labour market***

**Q 1.** Has your institution made changes in the past 12 months in terms of introducing a new product/service/operation due to climate change adaptation or mitigation? [**Mitigation:** mitigation includes all measures taken to reduce negative impacts of human activities on the environment and is achieved by reducing both the energy intensity of GDP and the carbon intensity of energy used (OECD, 2008a, p. 11).<sup>4</sup> **Adaptation:** adaptation consists in deliberate actions undertaken to reduce the adverse consequences [of climate change] as well as to harness any beneficial opportunities” (OECD, 2008b, p. 1).<sup>5</sup>]

**NO**  (go to Q 2)    **YES**

If the answer to Q 1 is **YES**

**Q 1.1** What are the main reasons for those changes? [choose all the appropriate]

- Change in climate and/or environmental conditions
- Change in consumers' preferences or in market trends
- Adaptation to new demands of the customers
- Adaptation to new regulations related to climate change
- Environmental awareness of your enterprise/business
- Make the production processes more efficient

**Q 1.2** How have these changes been financed in your institution? [choose all the appropriate]

- No additional costs were incurred
- Adjustment of resources allocations to other activities, without affecting the general budget
- Additional budget through public programmes
- Fiscal reductions linked to these changes
- Collaboration with other organisms to limit the costs
- Others [specify]

**Q 1.3** Have these changes resulted in the need to enhance the capacities of the workers in your institution, or to train them?

**NO**  (go to Q 2)     **YES**

If the answer is **YES**,

**Q 1.3.1** Please indicate whether the workers have undertaken a training in the past 12 months.

**NO**              **YES**

**Q 2.** Do you consider that the products/services offered by your institution meet the green demands of your clients, both current and emerging? **Green demand:** specific needs required to develop or adjust a product, a service or a process to climate change requirements or regulations. These can be training

needs linked to eco-efficiency, need to identify new “green” markets, need to identify new partners, providers or clients, etc. [single response]

[elija una sola respuesta]

- Yes, totally
- Almost
- Not really [go to Q 2.1]
- Absolutely no [go to Q 2.1]

If the answer is **NO**

**Q 2.1** What are the reasons for this discrepancy? [choose all the appropriate]

- The institution does not have the qualified staff to meet these demands
- There are no skilled workers in the region to address these demands from the institution
- Difficulty to define the needs of these new demands
- The costs are too high/too expensive
- There is not enough demand to justify such a product or service
- The institution does not count with the necessary infrastructure
- Another institution covers or addresses these demands
- Others (specify)

**Q 3.** What internal changes have taken place in the institution in order to adapt it to the new needs of climate change? [choose all that apply]

- There have been NO internal changes
- New internal regulations
- Changes in the supply
- Recruitment of staff with different skills
- Creation of new job positions with new job profiles
- Transformation of job profiles
- Others (specify)



## Notes

1. OECD (2008a), *Climate Change Mitigation: What do we do?*, Paris.
2. OECD (2008b), *Economic Aspects of Adaptation to Climate Change: Costs, benefits and policy instruments*, Paris.
3. It was possible to choose several alternatives.
4. OECD (2008a), *Climate Change Mitigation: What do we do?*, Paris.
5. OECD (2008b), *Economic Aspects of Adaptation to Climate Change: Costs, benefits and policy instruments*, Paris.



## *About the authors*

### ***Gabriela Miranda, Project Manager***

Gabriela Miranda, Mexican, is a policy analyst with the OECD Local Economic and Employment Development (LEED) Division, where she has worked since 2002. Her work comprises analysis and recommendations of public policy approaches notably on entrepreneurship and innovation, clusters, green growth, and the Latin American region. Before joining the OECD, Gabriela worked in Mexico as a consultant for SME development within the TEC-FUNDES Programme. For over two years, she also co-managed a project with indigenous communities in Mexico, where she defined and implemented tailored strategies for entrepreneurial, social and local economic development, with a specific focus on ethnic minorities and women.

Gabriela is the manager of the project on Climate Change, Employment and Local Development, which is a key contribution of LEED to the horizontal *OECD Green Growth Strategy*. In LEED, Gabriela has led and contributed to various analytical studies in OECD and Latin American countries and has co-authored several reports. She has also participated as an expert in various events with partner organisations, including the ILO, the IADB, the EC and CAF. Gabriela holds a BSc in business and economics with a specialization on SME development from ITESM University in Mexico, and an MSc in international economics from Paris Dauphine University.

### ***Hyoung-Woo Chung, chapter on economic and labour market policies***

Hyoung-Woo Chung, South Korean, is a policy analyst with the OECD Employment Analysis and Policy Division, where he has worked since 2009. He is currently participating in the green jobs project in the division, while at the same time reviewing employment policy measures of OECD and other countries. Before joining the OECD, Mr. Chung worked for the Korean Ministry of Employment and Labour for 20 years. During his career in the government, mostly as a division director, he prepared bills to introduce the 40 hour work week, to increase maternity leave to 90 days, to introduce paid

child-care leave as well as to develop industrial health and safety system in Korea. From 2003 to 2006 he served for the Korean Delegation to the OECD at Paris as a policy advisor for employment, labour and social affairs. As a deputy director general for the Ministry since 2007, he developed policies for non-standard workers and worked to advance public and private employment service across the nation. He has also a keen interest in developing “make work pay” and active labour market policies in Korea when he returns to the Ministry in 2012.

Hyoung-Woo holds a BS in law from Choong Ang University in Korea, and two MS degrees in Public Policy (from Seoul National University in Korea) and in HRM and Industrial Relations (from University of Illinois at Urbana-Champaign in the USA).

### ***David Gibbs, chapter on enabling green growth***

David Gibbs is Professor of Human Geography and Director of the Graduate School at the University of Hull in the United Kingdom. He has previously worked at the Centre for Urban and Regional Development Studies at Newcastle University and at Manchester Metropolitan University. One of his main research interests is in the field of local and regional economic development, with a focus upon the interplay between economic development and the environment. He is the author of several journal articles on these topics, the book *Local Economic Development and the Environment* (Routledge, 2002) and co-editor of *The Sustainable Development Paradox* (Guilford, 2007). Recent research projects in this area include ESRC-funded work on “Sustainability and the Local Economy: The Role of Eco-Industrial Parks” and “Governance and Regulation in Local Environmental Policy Making” and current projects on “Low Carbon Supply Chains” (funded by the Centre for Low Carbon Futures) and “Low Carbon Shipping: A Systems Approach” (EPSRC-funded). In addition he has also undertaken work in collaboration with local and regional authorities and organisations and with the European Commission.

### ***Richard Howard, chapter on greening jobs***

Richard Howard is a Senior Economist at DTZ in the United Kingdom, with over five years consultancy experience related to economic development, sustainability and the low carbon economy. Richard leads DTZ’s Sustainability and Energy practice group and has worked extensively for clients in this field across the UK; including central, regional, and local government and the private sector. His experience covers project and programme development, monitoring and evaluation; skills and labour market analysis; sector and cluster analysis; economic impact assessment; and renewable

energy resource assessment. Recent project experience includes: a study into the jobs and skills implications of the transition to a low carbon economy (Liverpool City Council); an economic impact study of the Research Council's GBP 500 million Energy Portfolio; a study into the economic contribution of the sustainable energy sector in South West England; and an offshore wind market assessment for a port in North East Scotland. Richard was recently awarded a distinction for his MSc in Sustainability, Planning & Environmental Policy at the University of Cardiff, with his dissertation focusing on the extent to which future emissions targets can be achieved through the “decoupling” of growth from emissions.

### ***Carlos Ongallo, local diagnostic report and survey analysis***

Carlos Ongallo was born in Cáceres, Extremadura. He holds a PhD in Economics from ICADE. Dr Ongallo started his professional career in Avon Spain where he was responsible for the department of Research and Development for southern Europe as well for as marketing and communication from 1994-1999. He has been consultant for Astra Zeneca, Laboratorios Roche, Renault, Cepsa, Edelman España, Sanitas, Paradores de Turismo, Ministry of Health and Consumption, Garrigues, Tubos Reunidos, S.A., CEOE, Fundación MAPFRE, Real Club Canoe, among others. He is member of the quality board of the Xunta de Galicia. Dr Ongallo has led various research projects as well as European and Spanish calls. In 2000, he was attributed the National Prize of the Spanish Association of Staff Management. Carlos Ongallo is the author of 13 books and a significant number of articles in international magazines. He founded the Institute for the Development of Communication in Organisations (INDEC), and has been professor of Organisational Economics in the University of Comillas (Madrid) and University of Extremadura. He has led eight doctoral theses in Spain and abroad, and has been visiting professor in leadership and communication in 15 Universities in Europe and the United States. Recently, Carlos was the director of Business Relations at the University of Extremadura and coordinator of the Pathfinder platform for graduate employment. He currently is the Director of Institutional Relations at the Caja de Extremadura as well as the manager of its social agenda.

### ***Lisa Rustico, chapter on developing green skills***

Lisa Rustico is an Italian research fellow at the Department of Economics of the University of Modena and Reggio Emilia (Italy), where she carries out research on “Education and training in the light of a new legal framework of workers’ protections” analyzing the juridical tools and contractual arrangements, bridging the two worlds. Lisa currently attends an international PhD School in Human capital formation and labour relations where she carries

out a thesis on “Apprenticeship as a labour contract and as a lever for placement of young people”. She also cooperates with the Italian Ministry of Labour and its technical agencies on topics related to education and training for the labour market. She has been member of the Working Group supporting the “Study Committee on the future of education and training in Italy”. Moreover, Lisa is the general coordinator in Italy of “WiRES – Women in Renewable Energy Sector” a project co-funded by the European Commission (DG Employment) and led by Adapt (Association for the International and Comparative Studies on Labour Law and Industrial Relations) which promotes the role of social dialogue for boosting female employment and enhancing women working conditions in renewable energy sector, considering training as the major lever to cope with such restructuring processes. In Adapt, Lisa is also responsible for the International Greening Education Network and for international relations.