



CEDEFOP

European Centre for the Development
of Vocational Training

Skills for green jobs: an update

Spain

2018

[unedited proof copy]

This report has been prepared by Cedefop to contribute primarily as background research for the International Labour Organization's World Employment Social Outlook 2018: Greening with jobs. The reproduction or further use of the information included in this report requires prior permission from Cedefop.

Copyright © European Centre for the Development of Vocational Training (Cedefop), 2019
All rights reserved.

Please cite this report as:
Cedefop (2018). *Skills for green jobs in Spain: an update* [unedited proof copy]. Available only at: http://www.cedefop.europa.eu/files/spain_green_jobs_2018.pdf

Preface

Technological change, globalisation, ageing populations and climate change dramatically increase the pace of change in labour market and skill needs, for new and current jobs alike. The growing importance of sustainable development and the shift to a low-carbon economy imply structural changes across sectors and occupations. This shift leads to new 'green' jobs and 'greening' of existing ones that translate to new skill sets, update of curricula or even new qualifications; for example, the adoption and dissemination of clean technologies requires skills in technology application, adaptation and maintenance.

Skills gaps are already recognised as a major bottleneck in sectors closely linked to 'green economy', such as renewable energy, energy and resource efficiency, renovation of buildings, construction, environmental services, manufacturing. At the same time, the 'greening' of the economy creates skill needs across other sectors, as businesses, workers and entrepreneurs have to rapidly adapt to changes as a consequence of environmental policies.

Given the challenges, Cedefop and ILO joined forces in 2010 and produced the report *Skills for green jobs: a global view* (ILO, 2011). The research was based on 21 country studies with a primary focus on good practice examples of how national policies for greening economies are complemented by identification of skills needs and efficient skills response strategies. Cedefop covered country studies (Cedefop, 2010a) in six EU Member States: Denmark, Estonia, France, Germany, Spain (Cedefop, 2010b) and the UK. All studies were conducted based on the same research methodology and criteria for selection of case studies, and following identical structures.

In 2017, these studies were updated for the ILO flagship report *World employment and social outlook (WESO) 2018: greening with jobs*, published in May 2018 ⁽¹⁾. The country studies were used as background material for chapter 5 of the report on *Skills for the green transition* with the objective to analyse the trends towards decent work and environmental sustainability since 2010; and assess the impact of a transition towards a low-carbon, resource-efficient economy on the world of work.

This country report was produced by Cedefop, Department for skills and labour market, under the supervision of Alena Zukersteinova. Stelina Chatzichristou, Cedefop expert, was responsible for the research conducted from April 2017 to October 2017.

Cedefop would like to acknowledge the research team of the consortium led by Fondazione Giacomo Brodolini who conducted preliminary analysis and drafted their findings under project team leader Andrew McCoshan.

The full country reports are unedited and available only electronically. They are used as background information for Cedefop's synthesis report *Skills for green jobs: 2018 update* ⁽²⁾.

⁽¹⁾ Available from: https://www.ilo.org/weso-greening/documents/WESO_Greening_EN_web2.pdf

⁽²⁾ Available from: <http://www.cedefop.europa.eu/en/publications-and-resources/publications/3078>

Table of content

- List of boxes 5
- List of figures 5
- List of tables 5
- Executive summary 6
- 1. Introduction..... 7
- 2. Major changes in the economy and employment shifts in the green transition after 2009-10 8
 - 2.1. The labour demand 8
 - 2.2. The labour supply.....10
- 3. Key policies and regulations12
- 4. Skills development measures for the green economy14
 - 4.1. Skills needs identification and anticipation.....14
 - The process of identification and anticipation of skill needs.....14
 - 4.2. TVET provision for new green occupations and for greening established jobs and occupations.....17
 - The process of updating TVET provision.....18
 - Changes in TVET provision to address skills for green jobs20
 - The role of the private sector.....22
 - Training for employed workers23
 - 4.3. ALMPs and retraining measures25
 - The role of the private sector in ALMPs.....26
 - Target groups with higher training needs.....26
 - 4.4. The role of the private sector in skills training27
 - Employers’ involvement in skills training.....27
 - Financial incentives to employers to boost employees’ training27
 - Outreaching of training in the private sector32
 - 4.5. The role of the institutional set up.....32
- 5. Conclusions and recommendations33
- List of abbreviations.....35
- References36
- Further reading38
- Websites39

List of boxes

Box 1: Updating TVET provision and content in Spain.....	19
Box 2: The Emplea Verde programme	24

List of figures

Figure 1: Number of workers trained and average duration per training in green skills/skills for green jobs, 2009-16	29
Figure 2: Age and sex distribution of workers trained in green skills/skills for green jobs, 2016.....	29
Figure 3: Education level of workers trained in green skills/skills for green jobs, 2016	30
Figure 4: Professional level of workers trained in green skills/skills for green jobs, 2016	30
Figure 5: Type of training received by workers trained in green skills/skills for green jobs, 2016	31
Figure 6: Sector of workers trained in green skills/skills for green jobs, 2016	31
Figure 7: Distribution of training in green skills/skills for green jobs, by total number of training hours, 2016.....	31

List of tables

Table 1: Green occupations included in the 2017 yearly report	15
Table 2: Green activities in traditional sectors	18
Table 3: TVET diplomas categories in relation to green jobs	20
Table 4: 21 New 'TVET diplomas for green jobs', developed in 2008-17	22

Executive summary

This report focuses on the changes that have taken place in Spain since 2010 as a response to the skills demanded by the labour market in relation to the greening of the economy. The economic crisis negatively affected the attention paid to greening due to general budgetary cuts; but attention is growing once again in line with the economic recovery. Whilst there is not a specific procedure for the identification of skills related to green jobs, there are general skills anticipation schemes that take into account green needs and there is a growing awareness of the importance of green and greening jobs. These skills anticipation schemes include a wide institutional set up, bringing together employment and education authorities, as well as social partners, among others. Skills identified are taken into account to define the training provision through Technical Vocational Education and Training (TVET) actions for employed and unemployed workers. As a consequence, several changes have been observed in training provision in line with the greening of the economy. In addition, the private sector plays an important role in the identification and provision of training in relation to greening of the economy.

1. Introduction

This report identifies key drivers of greening of the economy in Spain since 2009-10, their impacts on employment and related occupational skills as well as broader technical and soft skills needs. It also describes the new programmes and measures that are being implemented to adjust the skills of the potential and current workforce and to retrain workers and upgrade skills for jobs in the green economy; additionally, it analyses the coherence and coordination between skills development policies and environmental sustainability/climate change policies.

The methodological approach of this report included desk research and interviews. Seven interviews have been conducted covering a wide range of stakeholders: government, social partners, public-private foundations and private employment agencies. Quantitative data is primarily sourced from national sources, such as statistics on training in companies for employed workers. When quantitative data from primary sources is not available, estimates or qualitative data are used. Information/data gaps are highlighted and addressed in Section 5, in relation to future steps in research in the field.

2. Major changes in the economy and employment shifts in the green transition after 2009-10

In 2009, the Spanish economy suffered an economic shock due to the economic crisis. In this context, sound stimulus packages were initially deployed, with some of them relevant to the 'green transition': some occupations in the construction sector, which was severely affected by the economic crisis, were considered to have potential in terms of (re)employment in 'green' occupations/'green processes'. One example was the retraining of construction workers into solar energy technicians.

In May 2010, a change was adopted in terms of economic policy: stimulus packages shifted to austerity policies with the internal devaluation strategy in mind. This strategy consisted of lowering the level of salaries and prices in Spain compared to the Euro area, with the aim of improving the country's competitive advantage, and thus recovering the economy in the medium-long term through the consequent growth of net exports. This strategy was put into action through budgetary cuts and several labour market reforms that lowered dismissal costs of workers with open-ended contracts. In line with the economic recovery, by 2014 the austerity cuts had slowly come to an end. Since then, the economy and the labour market have recovered, based, among other factors, on lower salaries than before. During that period, unemployment rose from 8.2% in 2007 to a maximum of 26% in 2013, falling to 19.6% in 2016 (last figure of the 2nd quarter for 2017 is 17.2%, although with seasonal effects).

Regarding the figures of total green jobs in Spain, there is a lack of information in recent statistics ⁽³⁾. According to the Ministry of Agriculture, Fisheries, Food and the Environment (MAPAMA), in 2010 green jobs in Spain covered the range 411 284 to 530 947 (MAPAMA, 2013).

2.1. The labour demand

Shaped by a severe economic crisis and the subsequent beginning of the recovery, several drivers have influenced the evolution of the green transition and influenced labour demand since 2009-10:

- (a) the growth of environmental awareness and the change in consumer culture. A growing share of consumers tend to appreciate 'green products' and are willing to pay higher prices compared to the 'non-green' alternative. These consumers are also more loyal to their brands, thus providing a constant and growing revenue stream for companies in

⁽³⁾ The statistics 'Employment in the environmental goods and services sector' (env_ac_egss1: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en) provided by Eurostat, do not include data for Spain.

green emerging sectors in what can be identified as a new but consolidated trend in consumer culture;

- (b) developments in the regulatory framework have been one of the main drivers. One example is the prohibition of chemical substances used in a broad range of sectors, from concrete industries to dry cleaning;
- (c) incentives schemes to fund green transition are often linked with the regulative framework. However, some of the existing schemes have been reversed in the 2010-17 period, such as those related to renewable energies (see below);
- (d) green activities account for an important share of the national resources for research and development and innovation, including highly qualified professionals; these resources provide opportunities for the development of these green activities.

Regarding sectors, 'green activities' have been developed mostly in:

- (a) transport, mainly motivated by sustainable mobility plans, adopted generally by local councils but also in some cases by regional governments; these plans also promote the use of public transport;
- (b) construction, through the promotion of building restoration and reforms for energy efficiency;
- (c) waste management activities, mainly due to recycling activities;
- (d) manufacturing. The increased demand for more energy efficient products affects several industries such as the production of electric vehicles. The regulation ⁽⁴⁾ of cars within cities according to their pollution levels plays a role as well (example: Madrid City Council, 2017) ;
- (e) organic agriculture and cattle. Spain is the European Union (EU) country with most land allocated to organic crops; between 2010 and 2015 this land increased by 21.9% ⁽⁵⁾;
- (f) looking to the future, opportunities have been identified in the greening of the tourism sector, which has a huge relevance to the Spanish economy.

In contrast, the strong support system for renewable energies that existed in 2009 was reformed in 2012. Before this reform, a strong system of incentives for investors in renewable energies, based on the feed-in tariff (FIT) system had existed since 1994 (Royal Decree, 1994). Incentives allowed highly profitable investments, but created a bubble in the sector as well. In 2012 (Royal Decree-Law, 2012), these incentives came to an end with retroactive effects, which brought about high legal uncertainty and a reduction of the activity in the sector in Spain. The sector has since then struggled to survive, mainly by becoming more export intensive. This export-oriented strategy is leading companies to relocate their activities

⁽⁴⁾ It states limitations for parking of vehicles according to environmental criteria. Available at: http://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/CalidadAire/Ficheros/PlanAireyC_C_092017.pdf

⁽⁵⁾ Source: Eurostat. Organic farming statistics. http://ec.europa.eu/eurostat/statistics-explained/index.php/Organic_farming_statistics

to other countries closer to their markets of demand. It has also motivated the purchase of Spanish companies by foreign firms (El Economista, 2017).

In 2015 (Royal Decree, 2015), the so called 'sun tax' was introduced, with the purpose of rationalising and regulating production and self-consumption of electricity; however, the regulation as such has not been developed yet so the tax has not been applied. However, since the tax was approved, concern exists that it could be applied retroactively, which is a legal uncertainty that may have further discouraged investment in renewable energy. It should be noted that in, addition to these framework norms at the national level, there are other programmes that incentivise renewable energies, often led by regional governments, or general programmes for the environment that also include renewable energy support, such as the Plan to Promote the Environment (PIMA) [Plan de Impulso al Medio Ambiente] (see next section).

Estimated direct employment in the renewable energy sector dropped from 56 204 in 2012 to 46 534 in 2015 and indirect employment from 60 298 to 29 121 jobs. However, the impact of the first period of the economic crisis seems to have been more intense on the destruction of jobs than the changes in the policy measures, as the number of estimated jobs in 2008 was 82 509 direct and 60 431 indirect (APPA, 2015).

2.2. The labour supply

The structure of the distribution of the labour force in Spain according to education levels is an issue particularly relevant to the green transition. This structure is shaped by high shares of high and low skilled workers and low shares of medium skilled. In comparison to EU-28, there is a higher percentage of workers (aged 25-64) with higher education ⁽⁶⁾, and also a higher percentage of workers with low education ⁽⁷⁾. In contrast, there is a lower percentage of workers with medium levels of education ⁽⁸⁾. Since 2009 there has been a shift of the population from the low education level group (48.4% in 2009 and 41.7% in 2016) to the high education level group (30% in 2009 and 35.7% in 2016), while the middle level education group has barely changed (about 22%). This lack of persons with a medium education level is likely to create a shortage of skilled workers for green jobs in the near future, because green jobs are expected to demand more middle-skilled workers. In addition, the percentage of students in STEM (Science, Technology, Engineering and Mathematics) programmes stood at 26% in 2016 but was decreasing at an average of 3.3% per year, having stood at

⁽⁶⁾ International Standard Classification of Education, ISCED 5-8, 35.7% in 2016, compared with 30.7% in the EU-28.

⁽⁷⁾ ISCED 1-2, 41.7%, compared with 23% in the EU-28.

⁽⁸⁾ ISCED 3-4, 22.6%, compared with 46.3% in the EU-28. Source: Own calculation from Labour Force Survey (LFS). Spanish Statistical Institute (INE). The LFS is available at: http://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736176918&menu=resultados&idp=1254735976595

30% five years before (Randstad Research, 2016). STEM graduates are considered to be in greater demand than other graduates in green occupations, as the latter require strong skills in technology and engineering, especially relevant to renewable energy, energy efficiency, water management or electric vehicles. In the medium- and long-term these factors may lead to skill shortages of qualified workers for the green transition.

3. Key policies and regulations

Overall, regulations relevant to ‘green transition’ are promoted and implemented by national and regional authorities. The involvement of other stakeholders in these processes varies, with social partners holding a consultative role.

Key green and climate change policies are defined by the Ministry of Agriculture, Fisheries, Food and the Environment [Ministerio de Agricultura, Pesca, Alimentación y Medio ambiente], often summarised in this document as Ministry of Environment. The Ministry of Environment holds the Spanish Office of Climate Change (OECC) [Oficina Española de Cambio Climático], which is the responsible body for the definition and coordination of climate change related policies, that are gathered in the Spanish National Climate Change Adaptation Plan (PNACC) [Plan Nacional de Adaptación al Cambio Climático]. This plan is currently at the core of the Spanish environmental policy, rather than the National Strategy for Sustainable Development (Ministerio de la Presidencia, 2007), which remains unchanged since its approval in 2007. It has not been updated since. Gender data or analysis are absent from the PNACC; however, available data about workers in green occupations, used to map skills gaps, are broken down by gender. These data could already be used to improve gender-relevant analysis and approaches of green related strategies.

The Ministry of Environment has also developed several programmes that shape the green policies at national level. The PIMA ⁽⁹⁾ offers economic incentives to reduce the environmental impact of relevant economic activities, for example waste and transport, and promote the use of alternative energy sources. For example, the PIMA programme for companies offers economic incentives to companies for the adoption of carbon footprints, promotion of energy efficiency, renewable energies, reduction of emissions of greenhouse gases and substitution with less environmentally harmful ones.

The Ministry of Environment also promotes ‘CLIMA (Environment) Projects’ ⁽¹⁰⁾. The CLIMA programme subsidises projects that aim to reduce greenhouse gas emissions within ‘diffuse sectors’ that are not ascribed to the European regime of emissions trading (such as the transport, agriculture, building and waste sectors).

In addition, the European Regional Development Fund (ERDF) includes an Operative Programme (OP) of Sustainable Growth ⁽¹¹⁾. The programme focuses on low carbon economy; sustainable and comprehensive urban development; water quality; and sustainable transport. This programme does take into account the gender perspective,

⁽⁹⁾ More information about PIMA can be found at: <http://www.mapama.gob.es/es/cambio-climatico/planes-y-estrategias/PIMAS.aspx>

⁽¹⁰⁾ More information about CLIMA projects can be found at: <http://www.mapama.gob.es/es/cambio-climatico/temas/proyectos-clima/>

⁽¹¹⁾ European Commission. Regional Policy. Sustainable growth ERDF 2014-20 OP: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/spain/2014es16fop002

regarding the gender digital divide and the need to adopt the gender approach in addressing the insertion of vulnerable groups into the labour market in deprived urban areas.

The latest development concerns the Law on Climate Change and Energy Transition [Ley de cambio climático y transición energética] which was under public consultation until October 2017 ⁽¹²⁾. This law aims to fulfil the commitments undertaken by Spain within EU regulation frameworks and under the 2015 Paris Agreement ⁽¹³⁾.

⁽¹²⁾ <http://www.lccte.gob.es/>

⁽¹³⁾ https://ec.europa.eu/clima/policies/international/negotiations/paris_en

4. Skills development measures for the green economy

4.1. Skills needs identification and anticipation

The process of identification and anticipation of skill needs

There is not a specific procedure for the identification of skills related to green jobs and the organisation of the skills response in Spain; but general skills identification and anticipation schemes in the fields of employment and education take into account the skill needs of greening economy as well. These schemes do not include environmental authorities (Ministry for environment, OECC) as core institutions, although these are in fact connected with the employment and education authorities responsible of the identification of skill gaps. Indeed, employment or education authorities do not receive regular and formal inputs from environment or energy regulation authorities who might approve relevant measures for green jobs and their skills gaps, although communication takes place through several channels on a non-regular basis: new regulations pass through a series of open consultations, inter-ministerial communication takes place, while sectoral representatives will likely report to education/employment institutions about the skill challenges deriving or impacted from new regulations. Thus, there are systematic processes of identification and anticipation of skill needs and several non-systematic processes that are also important. More information on the skills anticipation in the country can be found on the Skills Panorama ⁽¹⁴⁾.

The systematic processes bring together several institutions for the anticipation and identification of the skills needed in the labour market. They include mainly several organisations of the public administration, social partners and experts. In addition, other agents can participate in the process (single private companies, universities or even high skilled and experienced workers can be occasionally consulted or can suggest the need to update training provision). As mentioned, this process is general and responds to any trends or changes that have an impact on the skills needed in the labour market, including the green transition.

It should be noted that the final decision on the provision of training relies on the employment and education authorities at the ministerial level. Thus, the role of the agents that are part of the institutional set up is to report information on the identification and anticipation of the skill needs, not to make the final decision.

This scheme is based on three parallel processes, two led by employment authorities and another led by education ones. Employment authorities define training for unemployed workers, for employed workers and TVET within the employment system (Professional Certificates). Education authorities define TVET within the education system.

⁽¹⁴⁾ http://skillspanorama.cedefop.europa.eu/en/analytical_highligths/skills-anticipation-spain

The system governed by the employment administration is led by the central public employment service (PES) (SEPE) through the Observatory of Occupations [Observatorio de las Ocupaciones]. SEPE falls under the remit of the Ministry of Employment and Social Security. The Observatory selects on an annual basis around 200 occupations to be analysed. The selection focuses on occupations that are quickly growing in relation to the number of work contracts. The skill gaps relevant to these approximately 200 selected occupations are analysed by regional groups of the regional network of the observatory, who contact experts from the observatory network. Experts include: employers, human resources managers, trades unions and business associations representatives, high skilled workers, excellence centres of TVET training and universities.

The Observatory has studied several green occupations so as to identify skill gaps in green occupations, which have been included in its 2017 yearly report [Informe anual de prospección y detección de necesidades formativas] ⁽¹⁵⁾. The analysis is based, inter alia, on experts' suggestions for each occupation ⁽¹⁶⁾.

Table 1: Green occupations included in the 2017 yearly report

Green occupation	Skill gaps identified
Forest and environment agents	Prevention of forest fires; topography; use of compass; driving of vehicles
Qualified workers in hunting activities	Veterinary first aid, environmental protection, plants, wildlife, fire prevention and management
Forest fire workers	Use of specific radio networks (Tetrapol)
Qualified workers in forestry and natural environment activities	Occupational risk prevention, pruning, fabrication of biomass, natural environment, use of chainsaw
Prevention of labour and environment risks agents	Law, new chemical substances, nanotechnology
Waste classification workers	Differentiation of types of waste and treatment for each type of waste. In the future training on new regulations, new materials and new waste management systems can be needed
Environmental and forest technicians	Cost and process analysis of forest exploitation, forest certification (PEFC and FSC) ⁽¹⁷⁾ , forestry related legislation, management and planning methodologies
Vehicle cleaners	Environmental background
Sweepers	Waste classification according to environmentally friendly criteria
Power plants technicians	Electric cogeneration in small power plants; wind turbines
Electricity technicians	Renewable energy; energy efficiency; electric and hybrid vehicles; LED lighting

Source: Observatory of Occupations. This information is not publicly available.

Note: Only the skills relevant for green jobs or greening are included. The Observatory of occupations analyses skill gaps of any type, including knowledge of foreign languages, law, administrative and technical/IT skills.

⁽¹⁵⁾ <https://www.sepe.es/contenidos/comunicacion/noticias/perfiles-oferta-empleo-2017-101017.html>

⁽¹⁶⁾ More reports carried out by the Observatory of Occupations can be found at: https://www.sepe.es/contenidos/que_es_el_sepe/observatorio/observatorio.html

⁽¹⁷⁾ PEFC: Programme for the Endorsement of Forest Certification. FSC: Forest Stewardship Council.

In addition to the Observatory, the Ministry of Employment and Social Security also manages Fundae⁽¹⁸⁾, the State Foundation for Training for employment [Fundación estatal para la formación para el empleo], which is responsible for the management of life-long learning for employed workers. Fundae leads another scheme for forecasting and planning of skills demands and the organisation of the skills response through studies and research. Social partners play a key role in Fundae's activities through working groups that focus on the skills needs of each sector, called the Sectoral Joint Committees [Comisiones Paritarias Sectoriales]. Sectoral Joint Committees are a traditional institution of social dialogue related to forecasting skills demands and training needs assessment. There are 87 Sectoral Joint Committees in 2017 that produce training reference plans to reflect key training needs⁽¹⁹⁾. Among them, there are several committees of sectors relevant to green activities, such as: water management activities; waste management and recycling; and forestry, agriculture and livestock. There are also other committees of sectors relevant in terms of potential greening of their activities, such as: construction; engineering and technical studies companies; chemical industry; wood; merchant shipping; and graphic arts, carton and paper. The work of Sectoral Joint Committees is essential to guide the provision of training funded by Fundae as well as other forms of training for employment, including TVET provision within the employment system.

The other part of the system is led by the education administration but with an important role for the employment administration. This part of the system focuses on the definition of training needs for TVET provision. INCUAL (National Qualifications Institute), which is under the remit of the Ministry of Education, Culture and Sports, follows the evolution of professions (mainly through the Observatory of Professions, a department within INCUAL) and defines the training responses to the skill gaps that have been identified. INCUAL, although belonging to the Ministry of Education, is also the technical body of the General Council of Vocational Training, an organisation that gathers together representatives from central and regional governments, as well as from social partners, but is governed by the Ministry of Employment and Social Security (Royal Decree, 1997). Further detail on the role of these organisations is provided in Section 4.2.

There is a strong and well-established relationship between the main institutions leading the processes at the employment and education administrations, as well as Fundae in terms of producing skills intelligence. This coordination was strengthened with Law (30/2015) that regulates the VET for employment system in the labour market. These institutions have recently started to use common methodologies to develop training needs identification and forecasting. In 2016 the Observatory of Occupations carried out a cooperation project with INCUAL to create a common database which included the occupations studied by the Observatory of Occupations and the skill gaps identified, plus the professional standards and

⁽¹⁸⁾ FUNDAE. <https://www.fundae.es/Pages/default.aspx>

⁽¹⁹⁾ A list of the current Sectoral Joint Committees can be read at: <https://www.fundae.es/Observatorio/Pages/CPListado.aspx>

TVET studies classified by professional families. Although this project has not continued in 2017 due to a lack of resources it has already set up a common methodological framework for the identification of skill gaps for occupations carried out separately by education and employment administrations.

The coordination mechanisms between the agents involved in these processes and specifically the role of social dialogue were reformed in 2015 (Royal Decree-Law, 2015). As a consequence, workers' and employers' representatives are now exclusively ascribed to training needs forecasting activities, as they can no longer provide training courses, as they did before the reform. The provision of training courses is now the exclusive competence of training centres. There are additional non-systematic processes outside this scheme. Trade unions play an important yet non-formal role in the identification of skill needs; the latter are mapped through direct contact with workers and the follow-up of safety and healthcare working conditions - which are also closely related to greening in some areas, such as the use of toxic or dangerous substances. Trade unions often increase awareness among workers about the opportunities (or the need) to replace such substances by safer and greener ones.

In the same direction, the network of 86 local chambers of commerce assesses the skills needs of their associated companies through interviews and surveys to local companies. The process is coordinated by the national chamber of commerce. The identification of skill needs facilitates the organisation of training activities by the chambers (Law, 30/2015) ⁽²⁰⁾, as well as guiding other training and employment activities such as the Comprehensive Programme of Qualification and Employment (PICE) [Programa Integral de Cualificación y Empleo] ⁽²¹⁾. Finally, universities and similar institutes also carry out their own identification of skill gaps to define their educational programmes. This identification of skill gaps is done mainly through surveys of graduates to assess skills demand among graduate employers ⁽²²⁾.

4.2. TVET provision for new green occupations and for greening established jobs and occupations

Experts stress that green jobs require workers of all education levels, although mainly TVET and university degrees are in demand. Among university graduates, STEM (Science, Technology, Engineering and Mathematics) ones are the most in demand in green occupations requiring high level qualifications.

⁽²⁰⁾ Skills Panorama. Analytical highlight in Spain:
http://skillspanorama.cedefop.europa.eu/en/analytical_highlights/skills-anticipation-spain

⁽²¹⁾ PICE is managed by Chambers of Commerce of Spain within the Youth Guarantee framework which combines training, internships, entrepreneurship support, labour intermediation and support for geographical mobility.

⁽²²⁾ Skills Panorama. Analytical highlight in Spain:
http://skillspanorama.cedefop.europa.eu/en/analytical_highlights/skills-anticipation-spain

It must be noted that there exist very few actually new green occupations. Instead, many of the 'new green occupations' are very similar to traditional non-green occupations. For example, occupations in the renewable energy sector often regard machinery production and installation and are thus not very different from occupations in other industries. This is also the case for the greening of traditional occupations in non-green sectors, which often require only a 'green'-pertinent training complement in terms of skills development. University or TVET programmes that are specifically focused on green occupations are also in place. Overall, experts argue that green occupations can be performed by workers of similar occupations if a training complement in green skills is provided to them. Several examples can illustrate this:

Table 2: Green activities in traditional sectors

Traditional sector	Green activity
Auxiliary automotive industry	Components for wind turbines
Electronic components and electricians	Components for wind turbines
Civil public works	Construction of thermoelectric generators
Chemical and electronic industries	Photovoltaic industry
Agriculture sector	Biomass activities
Shipyards	Offshore wind farms
Plumbers	Solar thermal energy

Source: Union Institute of Work, Environment and Health (ISTAS).

The process of updating TVET provision

As introduced in Section 4.1, in Spain there is not a specific process to update or adapt TVET provision so to accommodate the skill needs of new green occupations and those stemming from the 'greening' of established jobs. Instead, there is a process of identification of skills demanded by the labour market common for all occupations; the same process is also applied to new green jobs and to existing occupations that get 'greener'. Box 1 describes the processes in place for all types of TVET diplomas.

Box 1: Updating TVET provision and content in Spain

Overall, there is an ecosystem of several networks involving different departments and bodies of the public administration, as well as workers' and employers' representatives. This ecosystem provides information on emerging skills gaps, through systematic and non-systematic processes, to education authorities, that are responsible for the approval and modification of TVET diplomas. The decision should be made after consulting with the regional governments (Organic Law, 2/2006) and the General Council of Vocational Training (CGFP) (Organic Law, 5/2002).

The CGFP is the organisation that advises the government on TVET issues. Its main goals are to monitor professional qualifications in relation to the development of labour market needs; to set up and update vocational qualifications, adapting the professional training revision to the qualification demands of businesses; and to recognise vocational qualifications. The CGFP functions under the Ministry of Employment and Social Security and comprises a 77-member advisory body including the central and regional education and employment authorities, as well as employers' and workers' representatives (Royal Decree, 1997).

The technical body of the CGFP is the National Qualifications Institute (INCUAL) [Instituto Nacional de Cualificaciones], which is embedded in the Ministry of Education. INCUAL is responsible for defining, updating and adapting the Spanish National Catalogue of Professional Qualifications (CNCP) [Catálogo Nacional de Cualificaciones Profesionales] to the labour market. Qualifications are grouped into 26 professional families and five levels according to the professional skills required for each economic activity. INCUAL comprises several sub departments. One of them is responsible for the design of TVET programmes. Another area is the Observatory of Professions [Observatorio Profesional]. This observatory is responsible for following existing professions, the tasks to be carried out by them and their requirements, leading to the definition of professional standards for each occupation.

The definition of professional standards for each occupation and their follow-up and update is made through two working groups in INCUAL: one working group focuses on occupations while the other working group focuses on diplomas that, in turn, shape training provision. Both groups include sectoral experts and representatives of the public administration, trades unions and employers' associations, suggested by CGFP. The working group of diplomas also includes experts in education, which should define the changes needed in TVET provision to respond to labour market demands identified through the observation of occupations. As an example of the work carried out, new TVET diplomas on renewable energy were suggested by associations of the renewable energy sector, offering guidance to the education authorities on the design of the associated TVET studies.

The systematic process of working groups and consultation leads to the update of qualifications included in the National Catalogue of Professional Qualifications. The qualifications included in this catalogue must be updated every five years, in terms of contents, denominations, schedules, etc.

The process described supports the government in updating the curricula of TVET diplomas and creation of new ones. In practice, in addition to this process, the Ministry of Education, Culture and Sports holds frequent communication with a broad and open set of agents (other administrations, foundations, trades unions, business associations or companies) receiving inputs on the evolution of labour market demands and contributing to the definitive process of updating the TVET provision. This communication includes the government departments responsible for 'green' regulation; however, environmental authorities are not formally obliged to report to education authorities on actions that may impact skills demand which, in turn, would have to be considered in TVET provision.

Implementation of the new curricula/diplomas falls under the regional governments competences, which focus on TVET diplomas more relevant to their skill needs. Once implementation is complete, sectoral representatives or other agents start to communicate to the Ministry of Education their demands for new changes, starting the described process again. This process takes about five years, in line with the regulation of the CNCP, which, as mentioned above, states that the qualifications should be updated every five years. As shown below, TVET diplomas are frequently updated, although not necessarily every five years, taking into consideration sectoral demands.

Changes in TVET provision to address skills for green jobs

During 2007-10 all TVET diplomas incorporated 'green' content to a certain extent, following a trend of including transversal content relevant to greening and environmental awareness. The integration of this 'green' content was not organised by any law or strategy. Since 2010, there has been considerable activity to create new TVET diplomas and update existing ones with a focus on skills required for 'green jobs'. Indeed, most of the TVET diplomas related to green jobs have been created or updated since then.

In mid-2017, there were 166 TVET diplomas in Spain, each of them approved by a Royal Decree. The Ministry of Education, Culture and Sports has provided a classification of these diplomas, specifically for this report, according to green jobs criteria. These criteria follow the ILO Green Jobs definition⁽²³⁾: *'Green jobs are decent jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency'*. Following this definition, the criteria differentiate between diplomas mainly for green occupations and diplomas that could be for green occupations or for other occupations. The remaining diplomas are divided between those that include content relevant to the adaptation of the occupations to greening criteria and diplomas that include just general transversal green content.

Table 3: TVET diplomas categories in relation to green jobs

TVET diploma	Number of diplomas
TVET diplomas for green jobs	21
TVET diplomas that train for several occupations, some of which can be considered to be green jobs	26
TVET diplomas that include relevant training content that responds to green criteria, such as the application of environmental regulations	78
TVET diplomas that include transversal green content (NB all diplomas contain transversal green content)	35
Total	166

Source: Ministry of Education, Culture and Sports (2017).

The 21 'TVET diplomas for green jobs' offer training specifically for a green occupation. In contrast, the 26 'TVET Diplomas that train for several occupations, some of which can be considered to be green jobs', provide a skills background that can be applied to a green or a non-green occupation. The third category, 'TVET Diplomas that include relevant training content that responds to green criteria, such as the application of environmental regulations', are not designed for green occupations but have undergone a greening process through the inclusion of relevant content. Finally, the fourth category includes the remaining diplomas, which include general green transversal content.

In Table 3, out of the 21 'TVET diplomas for green jobs', 17 have been created after 2010. Out of the 26 'TVET diplomas that train for several occupations (some of which can be

⁽²³⁾ http://www.ilo.org/global/topics/green-jobs/news/WCMS_220248/lang--en/index.htm

considered to be green jobs') four have been created since 2010. Thus, it can be argued that 21 new TVET diplomas (12.6% of all 166 new diplomas) were created since 2010 as a response to the demands of green jobs.

The list of 'TVET diplomas for green jobs' introduced since 2008 can be found in Table 4.

Table 4: 21 New ‘TVET diplomas for green jobs’, developed in 2008-17

	TVET diploma	Level	Year of introduction
1	Automatic electric installations [instalaciones eléctricas y automáticas]	Medium	2008
2	Energy efficiency and solar thermal energy [eficiencia energética y energía solar térmica]	High	2008
3	Agroecologic production [producción agroecológica]	Medium	2009
4	Farm production [producción agropecuaria]	Medium	2009
5	Gardening and floristry [jardinería y floristería]	Medium	2010
6	Forest and environment management [gestión forestal y del medio natural]	High	2011
7	Landscape and rural areas [paisajismo y medio rural]	High	2011
8	Electric powerhouses [centrales eléctricas]	High	2011
9	Renewable energies [energías renovables]	High	2011
10	Aquaculture [acuicultura]	High	2011
11	Education and environmental management [educación y control ambiental]	High	2011
12	Use and conservation of the environment [aprovechamiento y conservación del medio natural]	Medium	2012
13	Livestock and animal healthcare assistance [ganadería y asistencia en sanidad animal]	High	2012
14	Farm activities [actividades agropecuarias]	Basic	2014
15	Agro gardening and flower compositions [agrojardinería y composiciones florals]	Basic	2014
16	Forest uses [aprovechamientos forestales]	Basic	2014
17	Electricity and electronics [electricidad y electrónica]	Basic	2014
18	Mechanics and electronic installations [instalaciones electrotécnicas y mecánica]	Basic	2015
19	Water treatment facilities and networks [T. redes y estaciones de tratamiento de aguas]	Medium	2017
20	Water management [gestión del agua]	High	2017
21	Chemistry and environmental chemistry [química y salud ambiental]	High	-

Source: Ministry of Education, Culture and Sports, 2017.

The economic crisis has influenced the implementation speed of these changes in TVET provision relevant for green jobs, as it has reduced the availability of financial resources. This scarcity has also influenced the decision of several regional governments to concentrate on the implementation of diplomas that were more relevant for their regional development strategies. Navarra has, for example, developed diplomas for forest management while Andalusia has focused on those for organic agriculture.

The role of the private sector

TVET provision often also responds to the demands of sectors. According to experts, the process is instigated once a number of companies have consolidated their investment in green products, have created a ‘green cluster’ in a region and are then able to motivate the regional government to invest in the implementation of newly approved TVET programmes that this sector demands. One example is the investment in electric vehicle production, which motivated TVET programmes in the regions where the investment and production is located. A concrete case is the adaptation of the high TVET automotive diploma (técnico superior en

automoción) to the skills required for the production of electric cars in Castilla y León, a region with a cluster of automotive industry, including the production of electric vehicles.

Thus, the role of the private sector and of social dialogue is prominent across the process of identification and implementation of changes in TVET provision: companies' and social partners' representatives are part of the working groups which define the changes and the skills needed in the Observatory of Professions of INCUAL; they also make up part of the technical body of the CGFP, which is the main advisory body for the government regarding its TVET related decisions. Moreover, the private sector and social partners may directly communicate with the Ministry of Education to suggest the approval of new TVET diplomas or the modification of already existing ones. Once TVET diplomas are approved or modified, they would then ask the regional governments to implement these diplomas. Once implemented, apprenticeship schemes create daily communication channels between companies and schools, transferring knowledge and awareness about the need to update content and implement new technologies.

Training for employed workers

As mentioned in Section 4.1, Fundae manages training courses for employed workers. The content of these courses is decided through a complex procedure to identify skill needs. In 2015, 327 training actions trained 4 634 employed workers in skills relevant to green jobs or the greening of existing occupations ⁽²⁴⁾. The average duration of the training received was 90.6 hours per worker, thus reaching a total number of 419 704 hours. Training for employed workers in green skills reached 0.03% of employed workers in Spain ⁽²⁵⁾, and has been declining since 2010, when 1 459 training actions reached 15 785 employed workers. The number of employed workers trained in green skills dropped by 70.6% between 2010 and 2015 although the average duration of courses increased by 18% (13.8 hours). Training actions for employed workers have covered diverse content, reaching 24 categories in 2015. The most numerous has been general environmental management, reaching 26% of workers trained, followed by photovoltaic and wind energy installations (17.5%), engineering and new technologies (11.7%), forestry works (11.3%) and installation of thermal solar energy (5.3%). The remaining 28.2% is distributed across 15 different minor categories ⁽²⁶⁾. Regarding the outreach of these courses, difficulties have been identified in reaching certain groups, such

⁽²⁴⁾ In 2014 (latest available data) 180 000 employed workers received training (Source: Ministry of Employment and Social Security).

⁽²⁵⁾ Calculated over 17 866 000 employed workers in Spain in 2015 (LFS, Spanish Institute of Statistics).

⁽²⁶⁾ In addition to the organisation of these training actions, Fundae offers economic incentives that cover a share of the cost of the courses that companies demand for their employees. Further detail about these incentives is provided in Section 4.4.

as small and medium-sized enterprises (SMEs) and their employees and those who are self-employed ⁽²⁷⁾.

There are other training projects targeting development of green skills of employed workers. The most relevant is the Emplea Verde (green employment) Programme shown in Box 2.

Box 2: The Emplea Verde programme

This programme is led by the Biodiversity Foundation ⁽²⁸⁾, a public body embedded in the Ministry of Environment, and has been co-funded by the European Social Fund (ESF) since 2007. The Emplea Verde Programme aims to promote employment and competitiveness of the private sector through environmental transformation and greening. For this purpose, one of its targets is to improve workers' skills. Since 2007, 1 900 courses in green skills have been provided, including diverse environmental skills, sustainability culture, new demands from the labour market and promotion of SME internationalisation. As result, around 60 000 employed workers (32% women) from 24,000 entities (94% SMEs, 3% large companies and 3% NGOs) received training between 2007 and 2015. Emplea Verde prioritises certain groups of citizens, such as women, workers of rural and environmentally protected areas, workers over 45 years old, persons with low education level, migrants and, recently, young persons under 30 years old. Workers of declining sectors also receive retraining into green sectors. In fact the list of groups prioritised is so extensive it includes all the population except Spanish men aged 30-45 with medium or high education level that live in urban areas and do not work in declining sectors.

In addition, support to green entrepreneurs has been offered through the Emprende Verde (Green Entrepreneurship) programme, within the Emplea Verde programme framework. Since 2011 Emprende Verde has included a network, Red Emprende Verde, which promotes the creation and consolidation of green start-ups and green businesses. Between 2007 and 2015, the Emplea Verde programme contributed to the creation of 3 500 direct jobs, co-funded 270 projects and contributed to the creation of 2 600 green start-ups and businesses. Emplea Verde is included within ESF funding for the 2017-23 period. In this period, the budget will be EUR 67 million and aims to support 50 000 persons and 3 000 companies. The novelties in this new period are the support to blue economy projects (environmentally responsible activities at sea), focusing on Natura 2000 sites ⁽²⁹⁾, paying special attention to the unemployed, supporting social innovation projects and exchanging experiences and knowledge among EU green entrepreneurs.

Finally, there are several small scale initiatives, such as those carried out by the OECC. The OECC carries out the following actions for training in green jobs or in greening of existing occupations:

- (a) development of training materials, for example materials for TVET programmes of forest agents;

⁽²⁷⁾ Skills Panorama. Analytical highlight in Spain:
http://skillspanorama.cedefop.europa.eu/en/analytical_highlights/skills-anticipation-spain

⁽²⁸⁾ The Biodiversity Foundation also works in other training. For example, Life Shara programme (sharing awareness and governance of adaptation to climate change in Spain) organises training actions in skills related to adaptation to climate change for qualified workers in several sectors.

⁽²⁹⁾ As of June 2016, more than 3 000 marine Natura 2000 sites had been designated, which cover more than 5% of the total EU marine area (over 300 000 km²). The Habitats Directive lists nine marine habitat types and 16 species for which marine site designation is required, whilst the Birds Directive lists a further 60 bird species whose conservation requires marine site protection. More information at: http://ec.europa.eu/environment/nature/natura2000/marine/index_en.htm

- (b) coordination of research projects on greening of sectors or on the adaptation of sectors to climate change. These projects are developed by experts and are then disseminated through the OECC webpage ⁽³⁰⁾ and presented in events and workshops. One example is the workshop held in Madrid in June 2017 ⁽³¹⁾ on the adaptation of the insurance sector to climate change, which gathered together participants from meteorologists to insurance sector representatives;
- (c) expert support and guidance to training programmes organised by other entities.

The OECC does not regularly communicate with employment or education authorities as regards the design or the approval of measures that have strong potential for creating green jobs or for greening existing occupations. However, informal communication among high level representatives of administrations may exist.

4.3. ALMPs and retraining measures

In Spain the management of Active Labour Market Policies (ALMPs) is decentralised and implemented by regional PES. The national government coordinates ALMPs through the Employment Activation Strategy [Estrategia de Activación para el Empleo] and the Annual Employment Policy Plans (PAPE) [Plan Anual de Políticas de Empleo]. These plans set the budget for the different ALMPs and its regional distribution, including training actions.

Training managed by the PES may be not linked to qualifications. In addition to the vocational training programmes managed by the education authorities (Section 4.2), the Ministry of Employment and Social Security manages other vocational training programmes within the ALMP framework, called Professional Certificates [Certificados de Profesionalidad]. These certificates are provided by the national PES (SEPE) and the regional public employment services to unemployed workers who attend vocational training courses.

The content of the training is set by the central and regional PES offices taking into account the skills gaps identified, following the process described in Section 4.1, where the Observatory of Occupations (embedded in the central PES) plays a key role. More specifically, the central PES is responsible for the development of a multi-annual scenario, which should guide training for employment, including Professional Certificates. The Ministry of Employment should also take into account the activities in skills identification carried out by the Sectoral Joint Committees (sectoral working groups composed of social partners and managed by Fundae). These processes enable the constant updating of training provision under ALMP in line with the needs of the greening of the economy.

⁽³⁰⁾ <http://www.mapama.gob.es/es/cambio-climatico/temas/organismos-e-instituciones-implicados-en-la-lucha-contra-el-cambio-climatico-a-nivel-nacional/oficina-espanola-en-cambio-climatico/>

⁽³¹⁾ <http://www.mapama.gob.es/es/agua/formacion/GRI-Jornada-Taller-inundaciones-CC-Madrid.aspx>

The role of the private sector in ALMPs

Training to unemployed people is delivered through PES and is exclusively offered by authorised private training centres, as stipulated by the 2015 reform of the TVET system. The private sector plays an additional relevant role as employment service provider, as private placement agencies (so called ‘agencias de colocación’), can for example, offer placements to unemployed. These agencies do not particularly focus on skills needs or on training provision, but some of them (Randstadt, Infoempleo, among others) regularly carry out analyses to assess the evolution of or to anticipate skills gaps.

Target groups with higher training needs

As previously noted, Spain is challenged by a high share of workers with low education levels (and simultaneously there is a high share of the labour force that holds high level qualifications). Persons with low education levels suffer the highest unemployment rates (33.7% for those with only primary education, average unemployment rate of 19.6% [LFS 2016]). At the same time, within the unemployed population (3.9 million [LFS, 2017/Q2]), 54.6% have a low education level. Therefore persons with low education levels are those who need training the most.

Certain sub-groups of unemployed people have special access to training programmes. The already mentioned Annual Employment Policy Plans prioritise sub-groups of unemployed workers for ALMP actions, such as the long-term unemployed, older workers, young workers or vulnerable workers⁽³²⁾. Several ESF co-funded programmes, such as the Emplea Verde programme, usually prioritise as well certain groups, following environmental or vulnerability criteria – although the groups prioritised might exceed by far half of the target population (see above).

However, beyond these measures, it is worth mentioning that training provided by ALMP actions reached just 3.5% of unemployed workers in 2015 (Law, 30/2015)⁽³³⁾. The percentage of unemployed people that participate in training actions is higher (including actions that are not provided by ALMPs), but still regards only 16.7% of them. The percentage is even lower for the unemployed with low education levels, who suffer the highest unemployment rates (just 9.3% of unemployed with low education levels participate in a training action, compared with 23.5% of the unemployed with medium education levels and 27.9% of the unemployed with high education levels)⁽³⁴⁾.

⁽³²⁾ Priority of vulnerable workers for training is also stated in the Law 30/2015.

⁽³³⁾ Percentage calculated from data of the Ministry of Employment and Social Security and from the LFS (INE).

⁽³⁴⁾ Own calculations from LFS data (INE).

4.4. The role of the private sector in skills training

The private sector has often played a leading role in the skills identification and training process. It plays a dual role. On one hand, business associations and private companies provide useful qualitative information as participants in the process of identification of skill gaps (described in the sections above). In addition, private companies often identify their skill needs and provide the training response by themselves. Economic incentives provided by the government support the provision of training by the private sector.

Employers' involvement in skills training

The whole process of the identification of, demand for and provision of skills often happens within one company, outside the systematic procedure of identification of skill gaps described in the sections above. Some big corporations have their own organised training systems to complement on-the-job training. One example is the environmental training programme operated by Acciona⁽³⁵⁾. In 2016, the company had 1 910 employees in the renewable energy sector. In 2015, the programme of environmental training, called 'Acciona University', provided 34 618 training hours to employees in green and environmental subjects. Training varies from short courses and one-day activities to environmental courses of longer duration, organised in cooperation with the University of Alcalá (Madrid).

More broadly, many companies have opted for a wider diversification of their products as a means to overcome the crisis. In some cases, this led to the development of new green products or green versions of existing products. Consequently, training employees to support these developments was necessary. Companies have therefore provided their employees with training so to promote/adapt their skills. For example, it is argued that in companies of the auxiliary automotive industry it was their capital machinery and their staff's existing skills, supported by supplementary training that allowed for the production of components for wind turbines.

Financial incentives to employers to boost employees' training

In Spain employers are encouraged through financial incentives to offer skills training to their employees, including green skills. Incentives are delivered through social security rebates. Fundae⁽³⁶⁾ is responsible for the management of these incentives, which fund between 10%

⁽³⁵⁾ Acciona is a multi-national company with a diversified portfolio that works mainly on infrastructure construction and management, including water management, as well as in renewable energies. More information is available at: <https://www.acciona.com/es/sostenibilidad/medio-ambiente/formacion-medioambiental/>

⁽³⁶⁾ Fundae's main function is to manage and promote lifelong learning and training for employment with the objective of increasing workers' employability and companies' competitiveness. Fundae materialises a number of important roles and tasks: (a) manages the economic incentives delivered to companies to fund a share of the corporate training costs (Section 4.4); (b) directly organises and funds its own training courses, which are delivered through private training centres and are open to employed individuals (Section 4.2); (c) plays a role in the process of identification

and 20% of training costs. Training is put into action through courses for employees delivered directly by the company or by external private training providers. Several companies can agree to jointly coordinate training. Additionally, the system funds individual training leaves of absence [permisos individuales de formación] to workers engaging in training activities during their working time to obtain an official certificate, so as to promote their professional career. In these cases, Fundae funds the wages and social security costs corresponding to the time the workers need for these training activities. The foundation also runs a specific programme for youth employment (workers aged under 30 years), which includes training and traineeships.

Incentives provided by Fundae to companies for lifelong learning can be considered sufficient as they reached the training of 2 535 038 workers in 2016, which meant 13.8% of employed workers in Spain . Out of these workers, 61 984 received training in ‘green skills’, i.e. 2.5% of workers trained by actions that benefited from Fundae incentives ⁽³⁷⁾. The same incentives are offered for all training, regardless of the content.

The number of employees that attended such trainings ⁽³⁸⁾ on skills relevant to green jobs and supported by Fundae has doubled (from 30 382 in 2009 to 61 984 in 2016). Interestingly, however, during the same period, the average duration of each training action has halved, from 33.9 hours per participant to 16.9. As a result, the total number of hours (the product of the number of workers trained by the average duration of training action per worker) has remained constant across the 2009-16 period ⁽³⁹⁾ (Figure 1).

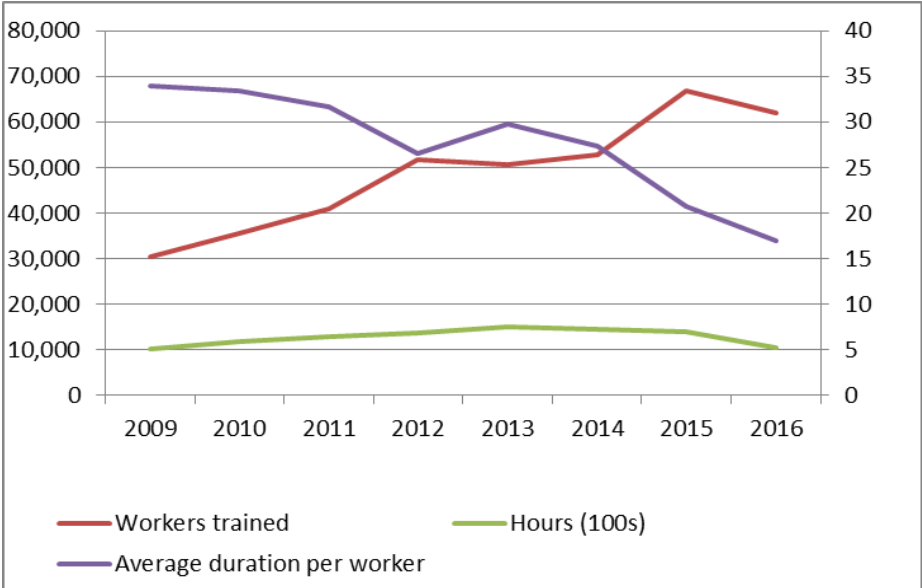
of skill needs as part of the institutional set up led by employment and education authorities (Section 4.1).

⁽³⁷⁾ Source: INE, LFS.

⁽³⁸⁾ Data presented in the Figures were provided by Fundae during the interview. It is an ad-hoc extraction of the database and refers to ‘training activities linked to the environment’ [Acciones formativas vinculadas con el sector medioambiental]. These activities include almost 50 different training contents, some of which related to green skills (e.g. environmental awareness, general environment management, etc.) and others to green jobs (e.g. gardening, forest exploitation, renewable energies technics, etc.).

⁽³⁹⁾ All the Figures (1 to 7) are for subsidised training actions.

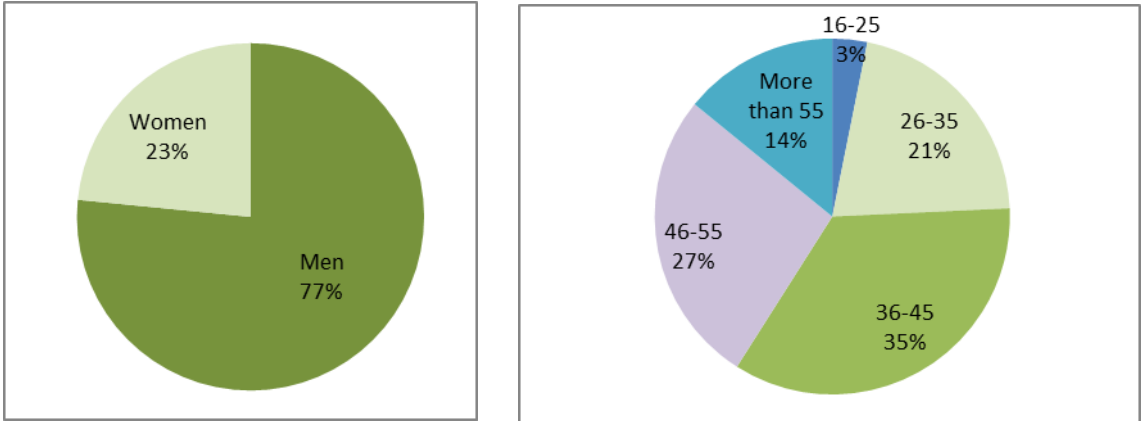
Figure 1: Number of workers trained and average duration per training in green skills/skills for green jobs, 2009-16



Source: Fundae.

Among workers trained in the same type of training and skills, the percentage of men (77%) is considerably higher than the share of women (23%). Regarding age there is a balanced distribution across age groups. The most numerous group are workers of medium age (36-45 years, 35%), followed by those over that age (46-55 years old, 27%) and then under that age (26-35 years old, 21%). Training actions are more frequently delivered to older workers (over 55) than to the youngest (under 25) (Figure 2).

Figure 2: Age and sex distribution of workers trained in green skills/skills for green jobs, 2016

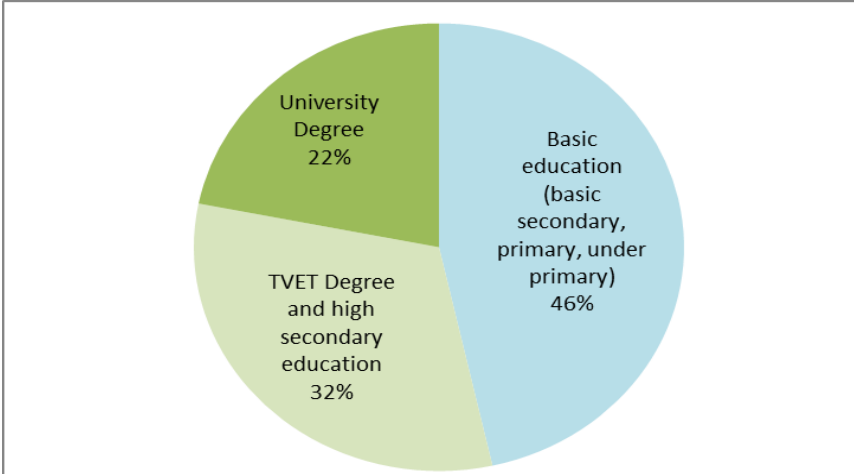


Source: Fundae.

Skills training for green jobs is delivered to people across all types of education levels, more frequently to workers with a lower education level (46% of the workers trained) than to those with a higher level (workers trained with a university degree represent 22% of total) (Figure 3). However many of the workers with lower education level work in posts for skilled workers or technicians, as the percentage of low-skilled workers among the total number of

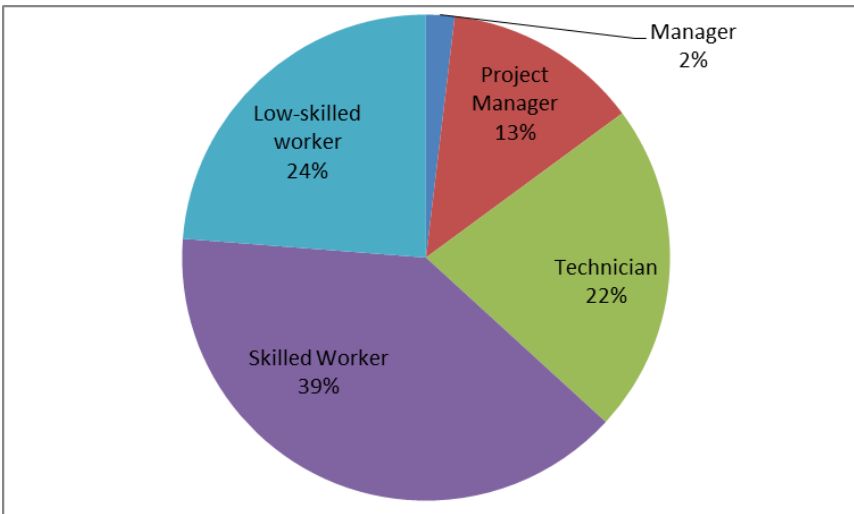
workers trained is just 24% (versus 46% of the workers with low educational level). This shows how skills are often acquired through professional experience and outside the formal education system. Training is delivered as well to all positions within companies, from low-skilled workers to project managers (13%) and managers (2%) (Figure 4).

Figure 3: Education level of workers trained in green skills/skills for green jobs, 2016



Source: Fundae.

Figure 4: Professional level of workers trained in green skills/skills for green jobs, 2016

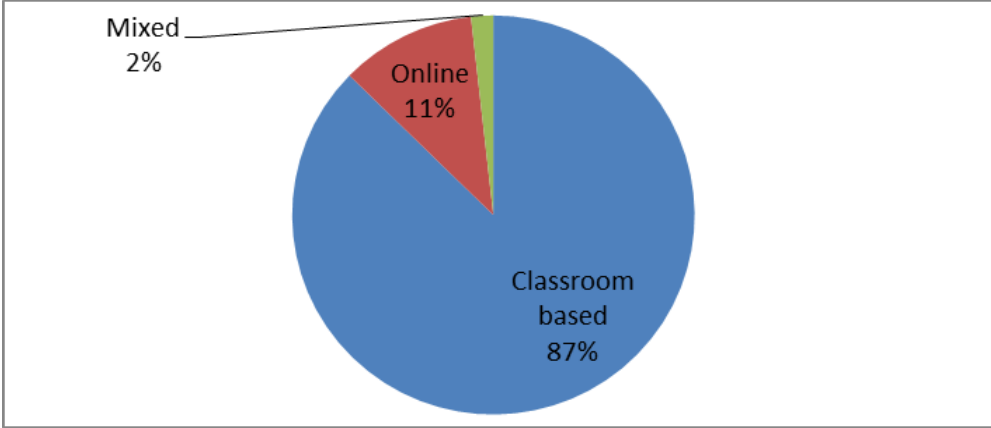


Source: Fundae.

Regarding the type of training, most actions are classroom-based (87%), rather than online or mixed (Figure 5). As regards the sectoral concentration, the industrial sector absorbs 43% of training for green jobs and services, other than hospitality (that gathers 7% of green training) and retail (5%), absorb 46% (Figure 6). Furthermore, these training courses spanned across 46 different categories regarding their content. Energy and water production, distribution and management are the most frequent focal points (22% of the total number of training hours), followed by pest control (17.8%) and environmental management

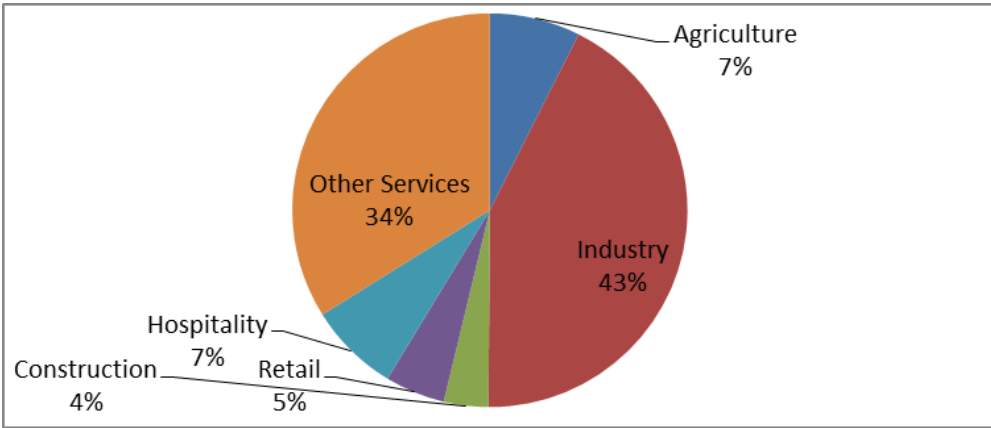
(13.5%). Engineering, research and development and innovation (9.2% of training hours) and waste management (9%) follow this ranking (Figure 7).

Figure 5: Type of training received by workers trained in green skills/skills for green jobs, 2016



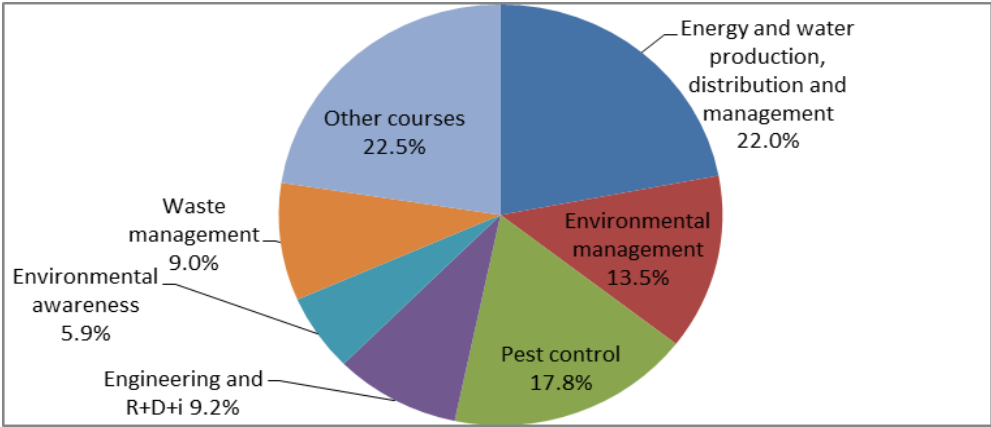
Source: Fundae.

Figure 6: Sector of workers trained in green skills/skills for green jobs, 2016



Source: Fundae.

Figure 7: Distribution of training in green skills/skills for green jobs, by total number of training hours, 2016



Source: Fundae.

Outreaching of training in the private sector

SMEs can benefit from the same incentives in the form of employers' Social Security rebates, and to a greater extent than larger companies. Overall and regardless the content of the training, incentives received by companies for training depend on their social security contributions, concretely on a concept within social security contributions called 'professional training', which equals 0.7% of the worker's base salary (0.6% paid by the employer and 0.1% by the employee). Companies with one to nine employees can benefit from up to 100% social security contributions paid for 'professional training' as incentives for training courses, while companies with 10 to 49 employees can benefit to the order of 75%, companies with 50 to 249 employees 60% and companies with over 250 workers 50% ⁽⁴⁰⁾.

In spite of this, SMEs face barriers to accessing the incentives for training, among which are: lack of knowledge about the incentive system for training; difficulties of making work and training compatible for workers; the complexity of administrative procedures; and lack of trust of SMEs in this system (UPTA, 2008). Although these barriers concern all types of training, it can be inferred that they are an important roadblock to the delivery of green skills pertinent training to SMEs' employees. To remove these barriers, Fundae organises guidance workshops and provides assistance to access the incentives for training. CEOE, the confederation of business associations of Spain, also organises workshops and offers assistance to companies (mainly SMEs) to gain access to the benefits provided for by Fundae.

4.5. The role of the institutional set up

In Spain, there is not a specific institutional set up to organise the skills response for green jobs. Instead, there are several general processes for the identification of skill gaps and the provision of training that take into account the needs for the greening of the economy. These processes are led by the Ministry of Employment and Social Security and by the Ministry of Education, Culture and Sports. Social partners play an important role in these processes, providing valuable information regarding labour market demands. The institutional set up of these processes is described mainly in Section 4.1.

⁽⁴⁰⁾ More info at Fundae:

<https://www.fundae.es/Empresas%20y%20organizaciones/Pages/Bonificacion-8pasos.aspx>

5. Conclusions and recommendations

The economic crisis negatively affected the attention paid to greening in a context of general budgetary cuts. The comprehensive national strategy for sustainable development, approved in 2007 by the then government, has not been updated since; although the strategy of climate change has been updated through successive working plans. There is neither a national strategy based on the ILO perspective on 'Just Transition' regarding the transition towards environmentally sustainable economies and societies for all (ILO, 2015). Nevertheless, attention to greening is growing again in line with the economic recovery. Interestingly, environmental awareness within the society seems to have increased since 2009, in line with the global context.

According to experts, greening of the Spanish economy has not been hindered or postponed so far due to a shortage in green skills, but due to the economic crisis and its consequences on the labour force availability and on the speed policy developments to promote the greening of the economy. However, experts remain very positive about the prospects for green sectors and the greening of the Spanish economy. This optimism responds to the economic recovery, to the consequent activation of greening policies, to the growth in environmental awareness within society and to the availability of cheaper green technologies, such as photovoltaic energy. Moreover, the crisis has, in some cases, motivated companies to innovate in new green products with relative success. Realising the development of these new production lines has often been based on the companies' human and capital resources, complemented with some training in specific green skills. Thus, greening has turned into an alternative to employment losses, which should be further exploited to create jobs.

In Spain, there is not a specific procedure for the identification of green skills and provision of related training, but a general process of identification of skills that is coordinated with training provision. This general process takes into account green jobs and greening of existing occupations, among the rest of occupations. Despite the lack of a dedicated process, a growing awareness of the importance of green jobs and greening of occupations is observed.

Even with its merits, the existing skills gaps identification approach mainly regards the present time, while forecasting activities are less frequent, especially those related to the longer term future. Improving skills anticipation through expanding the time horizon and widening the group of occupations studied would provide a more detailed overview and improved understanding of developments in more green occupations. Additional resources committed to skills anticipation could support such improvements.

An improved skills anticipation approach could suffice, without the development of a specific process of green skills identification. The activities and processes in place already enable the labour market to communicate skill demands in green issues (as proved by the fact that since 2009 several new TVET programmes for green jobs have been approved

while other programmes have incorporated green content). However, greening of occupations is often subtle, and the line that separates green and non-green jobs may be blurry. Therefore, the formal inclusion of the environmental and energy authorities in the green skills anticipation process would be an important step. Although several non-systematic channels of information exist, the formal participation of environment or energy authorities would allow direct reporting to employment and education authorities about relevant measures, such as new regulations or promotion plans, which are likely to have an impact on green jobs/greening of existing occupations and involve the demand of skills. As no significant barriers are identified for the direct participation of the environmental authorities, improving cross-departmental work and collaboration among stakeholders could be the most facilitating factor.

Following the adverse impact of the economic crisis, resources dedicated to ALMPs were reduced. Although the recent recovery has again spurred more attention and resources allocation to such programmes, further growth is needed. ALMP resources for training reach a small and diminishing percentage of the unemployed (around 6% of the unemployed participated in training actions within the ALMP in 2009 and only 3% in 2015). Coverage among employed workers is much higher, although mainly through incentives to lifelong learning actions in companies ⁽⁴¹⁾. It is important to improve the outreach of ALMP provision to persons who receive less coverage, such as temporary and freelance workers.

⁽⁴¹⁾ Source: Fundae.

List of abbreviations

ALMP	Active Labour Market Policy
Cedefop	European Centre for the Development of Vocational Training
CGFP	General Council of Vocational Training
CNCP	Spanish National Catalogue of Professional Qualifications [Catálogo Nacional de Cualificaciones Profesionales]
ESF	European Social Fund
EU	European Union
ERDF	European Regional Development Fund
FIT	Feed-in tariff
Fundae	State Foundation for Training for employment [Fundación estatal para la formación para el empleo]
FSC	Forest Stewardship Council.
ILO	International Labour Organization
INCUAL	National Qualifications Institute [Instituto Nacional de Cualificaciones]
INE	Spanish Statistical Institute [Instituto Nacional de Estadística]
ISCED	International Standard Classification of Education
ISTAS	Union Institute of Work, Environment and Health
LFS	Labour Force Survey
MAPAMA	Ministry of Agriculture, Fisheries, Food and the Environment [Ministerio de Agricultura, Pesca, Alimentación y Medio ambiente]
OECC	Spanish Office of Climate Change [Oficina Española de Cambio Climático]
PAPE	Annual Employment Policy Plans [Plan Anual de Políticas de Empleo]
PEFC	Programme for the Endorsement of Forest Certification
PES	Public employment service
PICE programme	Comprehensive Programme of Qualification and Employment [Programa Integral de Cualificación y Empleo]
PIMA	Plan to promote the environment [Plan de Impulso al Medio Ambiente]
PNACC	Spanish National Climate Change Adaptation Plan [Plan Nacional de Adaptación al Cambio Climático]
SEPE	Central public employment service
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical Vocational Education and Training

References

- APPA (2015). *Study of macroeconomic impact of the renewable energies*. Madrid: Association of Companies of Renewable Energies [Asociación de Empresas de Energías Renovables].
- Cedefop (2010a). *Skills for green job. European synthesis report*. Luxembourg: Publications Office of the European Union.
- Cedefop (2010b). *Skills for green jobs. Country report: Spain*. Thessaloniki: Cedefop.
- Cedefop (2019). *Skills for green jobs: 2018 update. European synthesis report*. Luxembourg: Publications Office. Cedefop reference series; No 109.
<http://data.europa.eu/doi/10.2801/750438>
- El Economista (2017). *Siemens cierra la compra de Gamesa y crea el segundo fabricante eólico mundial*. Article of 04/04/2017.
<http://www.eleconomista.es/energia/noticias/8269473/04/17/Siemens-cierra-la-compra-de-Gamesa-y-crea-el-segundo-fabricante-eolico-mundial.html>
- ILO (2015). *Guidelines for a just transition towards environmentally sustainable economies and societies for all*. Geneva: International Labour Office.
http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf
- ILO (2018). *World employment and social outlook: trends 2018*. Geneva: International Labour Office.
http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_615594.pdf
- Law (30/2015). Law 30 of 9th September 2015. *Regulation of the VET for employment system in the labour market*. [Ley 30/2015, de 9 de septiembre, por la que se regula el Sistema de Formación Profesional para el empleo en el ámbito laboral].
- Ministry of Education, Culture and Sports (2017). *Selection of new and modified TVET diplomas according to the Green Jobs criteria*. (not published, provided in the interview for this project).
- Ministry of Labour and Social Affairs (2016). *Estudio marco sobre sectores y ocupaciones ambientales* [Framework study on green sectors and occupations]. Madrid: Ministry of Labour and Social Affairs [Ministerio de trabajo y asuntos sociales]. (former Ministry of Employment and Social Security).
- Madrid City Council (2017). *Plan de Calidad de aire de la ciudad de Madrid y cambio climático* [Plan on air quality and climate change].
http://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/CalidadAire/Ficheros/PlanAireyCC_092017.pdf
- MAPAMA (2013). *Análisis y prospectiva* [Analysis and Forecasting], No 6, May 2013. Madrid: Ministerio de Agricultura, Pesca, Alimentación y Medio ambiente [Ministry of Agriculture, Fisheries, Food and the Environment].
- Ministerio de la Presidencia (2007). *Estrategia Española de desarrollo sostenible*. Madrid: Ministerio de la Presidencia.
- Organic Law (2/2006). Law 2 of 3rd of May 2006. *Education*. [Ley Orgánica 2/2006, de 3 de mayo, de educación].

- Organic Law (5/2002). Law 5 of 19th of June 2002. *Qualifications and vocational training* [Ley Orgánica 5/2002, de 19 de junio, de las cualificaciones y de la formación profesional].
- Randstad Research (2016). *Digitalization, creates or destroys Jobs?* and interviews.
- Royal Decree (1994). Royal Decree 23 of 9th of December 1994. *Production of electric energy through hydro, cogeneration or renewable energy installations* [Real Decreto 2366/1994, de 9 de diciembre, sobre producción de energía eléctrica por instalaciones hidráulicas, de cogeneración y otras abastecidas por recursos o fuentes de energía renovables].
- Royal Decree (1997). Royal Decree 1684 of 7th of November 1997. *Set up of the regulations for the Spanish general council of VET* [Real Decreto 1684/1997, de 7 de noviembre, por el que se aprueba el Reglamento de Funcionamiento del Consejo General de Formación Profesional].
- Royal Decree (2015). Royal Decree 900 of 9th of October 2015. *Regulation of the administrative, economic and technical conditions of electricity supply and production with self-consumption* [Real Decreto 900/2015, de 9 de octubre, por el que se regulan las condiciones administrativas, técnicas y económicas de las modalidades de suministro de energía eléctrica con autoconsumo y de producción con autoconsumo].
- Royal Decree-Law (2015). Royal Decree- Law 4 of 22nd of March 2015. *Urgent reform of the system of professional training for employment within the working environment* [Real Decreto-ley 4/2015, de 22 de marzo, para la reforma urgente del Sistema de Formación Profesional para el Empleo en el ámbito laboral].
- Royal Decree-Law (2012). Royal Decree-Law 1 of 27th of January 2012. *Proceeding to the suspension of procedures of pre allocation of retribution and of economic incentives for new energy electric installations, through cogeneration, renewable and waste sources* [Real Decreto-ley 1/2012, de 27 de enero, por el que se procede a la suspensión de los procedimientos de preasignación de retribución y a la supresión de los incentivos económicos para nuevas instalaciones de producción de energía eléctrica a partir de cogeneración, fuentes de energía renovables y residuos].
- SEPE (2017). *Fiches of training needs of selected occupations relevant for this report on green jobs* (not published, provided in the interview for this project).
- UPTA (2008). *El sistema de bonificación en el ámbito de pequeñas empresas. Optimización en el uso de recursos disponibles* [The system of incentives in SMEs. Optimization of available resources]. Unión de Profesionales Trabajadores Autónomos [General Union of Freelance Workers].

Further reading

- BOE (2012). *Plan anual de política de empleo* [Annual employment policy plan]. Madrid: BOE - Boletín oficial del estado [Official State Bulletin]
- BOE (2013). *Plan anual de política de empleo* [Annual employment policy plan]. Madrid: BOE - Boletín oficial del estado [Official State Bulletin]
- BOE (2016). *Plan anual de política de empleo* [Annual employment policy plan]. Madrid: BOE - Boletín oficial del estado [Official State Bulletin]
- EOI (2010). *Green Jobs: empleo verde en España* [Green jobs: green employment in Spain]. Madrid: Escuela de organización industrial.
<https://www.eoi.es/es/savia/publicaciones/19645/green-jobs-empleo-verde-en-espana-2010>
- FEMP (2011). *Guía para el fomento del empleo verde en los pequeños municipios españoles* [Guide for the promotion of green jobs in small municipalities in Spain]. Madrid: FEMP - Federación Española de Municipios y Provincias [Spanish Federation of Municipalities and Provinces]
- Law (19/1997). Law of 9th of June 1997. *Modification of law 1/1986, and creation of the Spanish General Council of VET*. [Ley 19/1997, de 9 de junio, por la que se modifica la Ley 1/1986, de 7 de enero, por la que se crea el Consejo General de Formación Profesional].
- Law (56/2003). Law of 16th of December 2003. *Employment* [Ley 56/2003, de 16 de diciembre, de Empleo].
- Organic Law (8/2013). Law of 9th of December. *The improvement of the quality of education*. [Ley Orgánica 8/2013, de 9 de diciembre, para la mejora de la calidad educativa].
- Royal Decree (2003). Royal Decree 1128 of 5th of September 2003. *Regulation of the national catalogue of professional qualifications* [Real Decreto 1128/2003, de 5 de septiembre, por el que se regula el Catálogo Nacional de Cualificaciones Profesionales].
- SEPE (2011). *Estudio prospectivo del sector de la automoción en España* [Prospective study of the automotive sector in Spain]. Madrid: Servicio Público de Empleo Estatal.

Websites

- 2015 Paris Agreement. https://ec.europa.eu/clima/policies/international/negotiations/paris_en
- Acciona. <https://www.acciona.com/es/sostenibilidad/medio-ambiente/formacion-medioambiental/>
- European Commission. Regional Policy. Sustainable growth ERDF 2014-20 OP. http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/spain/2014es16rfop002
- Eurostat. Education and training statistics. http://ec.europa.eu/eurostat/statistics-explained/index.php/Education_and_training
- Eurostat. Employment in the environmental goods and services sector' (env_ac_egss1). http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&lang=en
- Eurostat. Organic farming statistics. http://ec.europa.eu/eurostat/statistics-explained/index.php/Organic_farming_statistics
- FUNDAE. <https://www.fundae.es/Pages/default.aspx>
- FUNDAE. Sectoral Joint Committees. <https://www.fundae.es/Observatorio/Pages/CPListado.aspx>
- ILO. Definition of what is a green job. http://www.ilo.org/global/topics/green-jobs/news/WCMS_220248/lang--en/index.htm
- Jornada-Taller sobre inundaciones y cambio climático. Madrid, 21 de junio de 2017. <http://www.mapama.gob.es/es/agua/formacion/GRI-Jornada-Taller-inundaciones-CC-Madrid.aspx>
- Ministry of Employment and Social Security. Yearly Statistics (2009-2016). <http://www.ine.es/en/welcome.shtml>
- Natura 2000. http://ec.europa.eu/environment/nature/natura2000/marine/index_en.htm
- Observatory of Occupations: reports carried out. https://www.sepe.es/contenidos/que_es_el_sepe/observatorio/observatorio.html
- Public consultation of the Law on Climate Change and Energy Transition [Ley de cambio climático y transición energética]. <http://www.lccte.gob.es/>
- SEPE 2017 report: Informe anual de prospección y detección de necesidades formativas. <https://www.sepe.es/contenidos/comunicacion/noticias/perfiles-oferta-empleo-2017-101017.html>
- Skills Panorama analytical highlight: skills anticipation in Spain. http://skillspanorama.cedefop.europa.eu/en/analytical_highlights/skills-anticipation-spain
- Spanish National Climate Change Adaptation Plan. http://www.mapama.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/plan-nacional-adaptacion-cambio-climatico/planificacion_seguimiento.aspx
- Spanish Office of Climate Change. <http://www.mapama.gob.es/es/cambio-climatico/temas/organismos-e-instituciones-implicados-en-la-lucha-contra-el-cambio-climatico-a-nivel-nacional/oficina-espanola-en-cambio-climatico/>
- Spanish Statistical Institute. LFS. http://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736176918&menu=resultados&idp=1254735976595