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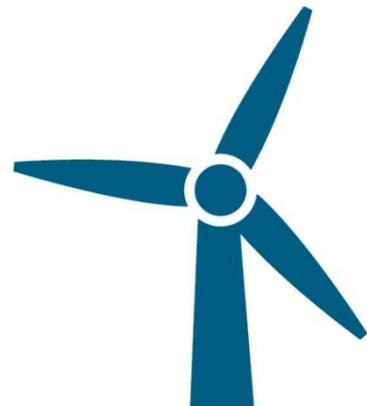
# The most in- demanded jobs in the Energy and Water Sector

REPORT

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*In collaboration with:*

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## 01. Introduction to the sector

The energy and water industry, increasingly focused on sustainable and energy saving, comprises three sub-sectors grouping different areas:

- **Water:** Includes the activities related to the construction and installation of water, the strategic development and the operating and maintenance of water.
- **Energy:** Comprises all the tasks related to the construction and installation of energy, strategic energy development and operation and maintenance of energy.
- **Renewable energy:** Includes activities such as construction and installation of renewable energy, strategic development of renewable energy and operation and maintenance of renewable energy.

Currently, due to the high demand for the existing resources, the creation of a sustainable system of exploitation and long-term consumption of both water and energy is a priority. For the creation of this system, it should be considered the possible areas that may face water shortages in the future and the challenge of tackling climate change and its impacts. Furthermore, it should be remarked that technological development offers considerable opportunities that may help to position the water and energy sector as key economical activities.

## 02. Current environment

### Global Trends:

There have been new developments in the energy sector related to the transition from fossil fuel to a more efficient and sustainable energy throughout 2015. Good evidence of this, is the data offered by the International Energy Agency, which indicates that renewable energy represented nearly half of all new electrical power plants in 2014. Thus, the so-called green energy is the second largest electricity generator worldwide, after coal, symbolizing the launch of the energy transition in many countries. Furthermore, the growing global commitment to reduce the emission of greenhouse gases and promote sustainability in order to be able to react to the growing demand for water and energy. This is mainly caused by the acceleration of urbanization in all countries, climate change and demographic changes.

Regarding the energy sector in Europe, still in 2015 depends on the foreign market in the consumption of fossil (oil) and nuclear. Consequently, during 2014 and 2015, the EU led worldwide the transition of the actual energy model to a model represented by the renewable energy, being it more efficient and sustainable. In this context, the European Union approved in 2014 the "Framework for Action on Climate and Energy 2030". This agreement between the EU countries focuses on various energy policies such as mandatory cut emissions of greenhouse gases by 40%; improving energy efficiency by 27% and build from 2015 the "Union of Energy" to ensure affordable, secure and sustainable energy. Also, there is currently an internal energy market through which all countries member of the EU have access to the European gas network and electricity.

On the other hand, the European Commission released the "European Energy Security Strategy" in 2014 in order to reduce dependence on gas from Russia and to increase energy production within the EU, among other favoring measures.

Regarding to water, it has become a key element of environmental policy and climate change adaptation. As a result, the European Union intensifies investments in innovative projects and the European Commission promotes international events like the “Europe Water Innovation “.

### Trends in Spain:

The situation of the Energy and the Water sector in Spain during the 2015 has been outlined by an important dependence on foreign markets, greater than the average for the European Union in oil, natural gas and nuclear fuel. Also, energy demand has begun to show signs of improvement as a result of the gradual economic recovery and increased consumption by businesses and households. Moreover, the Ministry of Industry, Energy and Tourism has fostered ten programs of financial assistance valued at 1.400 million euros in order to encourage energy saving and efficiency in buildings, industrial, transportation and municipalities.

With regard to employment, the activities that integrate the energy sector employed a total of 264.300 people in the third quarter of 2015, creating 23.500 new jobs and representing an increase of 9,8% over the same period in 2014. This reflects the positive tendency in job creation since late 2014 and throughout 2015.

Regarding the activity of water, water supply companies reached a total amount of 3.640 million euros in 2014, 2,5% more than in the previous year. Moreover, an increasing number of companies engaged in water management tend to diversify and intensify their business specialization mainly to urban and environmental services. In addition, they are committed to improve energy efficiency and infrastructure automation as well as control product quality and service quality.

### Trends in Catalonia:

The Energy and Water sector in Catalonia has improved over 2015 due to factors such as the progressive creation of employment and increased consumption of industrial and domestic energy. However, according to official data from the *Observatori d'Empresa i Ocupació (Generalitat de Catalunya)*, the number of companies in the sector fell by 3,4% and the total number of companies in 2014 were 1.736.

Regarding employment, the energy sector has created new jobs during 2015. The employment rate of the sector stood at 50.000 employees in the third quarter of 2015, which means an increase of 3,7% (4.300 employed people) over the same period in 2014.

In relation to water management companies, exist the Catalan Water Partnership, an association formed by more than 5.000 employees and 300 researchers that aims to improve the competitiveness of Catalan companies in the use of sustainable water. This cluster, with the collaboration of other companies in the sector, are increasingly betting on innovation and development of water business. Likewise, there have been presented more than 10 R&D projects in 2015 with initiatives such as to promote a more sustainable use in tourism establishments in Catalonia.

Energy and Water Indicators	Contribution of the sector to the Catalan GDP (1)	Employed population in Catalonia (2)	Number of companies in Catalonia(3)
	2,04% (2013)	50.000 (3rd quarter 2015)	1.736 (2014)

(1) According to data from “Industrial survey of Catalonia”, IDESCAT.

(2) Available data in the report of the 3Q 2015 EPA at the sectorial level. Observatori d'Empresa i Ocupació, Generalitat de Catalunya.

(3) Available data from Observatori d'Empresa i Ocupació, Generalitat de Catalunya November 2015.

## 03. Key sectorial trends

	<p><b>Sustainable Mobility</b></p>	<p>One of the trends of sustainable mobility sector is linked to increased social awareness on energy saving and pollution reduction. Public institutions boost new ways of urban mobility, and promote public transport and cycling. Examples of some energy projects developed in many cities around the world are the improvement of the thermal insulation of public, business and residential buildings, as well as the boost of the electronic car and the development of smart cities.</p>
	<p><b>Energy Model Transformation</b></p>	<p>The transformation of the conventional energy model is one of the greatest goals in the energy and water sector. Public institutions and companies in the sector are working and collaborating in diverse initiatives to achieve a safe, sustainable and competitive energy system for reducing dependence on fossil fuels (oil and coal). This is due to the current global energy situation which is characterized by a shortage of fossil fuels, the growth of global demand and the impact of climate change.</p> <p>In this context, from the European Union sustainable actions to combat environmental consequences of climate change are promoted. These measures pretend to reduce the emission of greenhouse gases, promote the development of technologies for CO2 capture and storage, as well as to boost energy sources such as wind, solar, bioenergy, marine, geothermal, hydrogen and nuclear energy. Furthermore, other European countries from the east have announced reforms to release their energy sectors and promote the transition to a new energy model.</p>
	<p><b>Energy Efficiency</b></p>	<p>Energy efficiency has become an indispensable tool to governments in order to alleviate the pressure of energy suppliers and mitigate as far as possible the price increases for fossil fuels (oil and coal). In addition, energy efficiency actions directly impact on reducing future growth in demand for oil and energy consumption, while reducing dependence on it.</p> <p>By the European Union, one of the objectives is to improve energy efficiency by 20% by 2020 through innovative initiatives that promote behaviours of citizens and social and technological patterns. This results into actions mainly focused on reducing energy consumption.</p>

	<p><b>New forms of Renewable Energy</b></p>	<p>The companies in the Energy and Water sector along with the public institutions invest in finding and developing new sources of clean, sustainable and renewable energies in order to reduce dependence on conventional energy sources. During 2014, there was a considerable progress in the field of renewable energy which resulted in an increased interest in developing new methods, systems and more sustainable techniques. Some of the main developments and innovations in the field of energy sources are: ultra-efficient solar design; flow batteries for renewable energy storage on a large scale, offshore wind energy storage, progress in the development of nuclear fusion technology, among others. Also in 2015, new sources of energy have been created such as evaporation (produce electricity in floating power generators).</p>
	<p><b>European Internal Market for Energy</b></p>	<p>The European Union is increasingly committed to the integration and interconnection of energy and water markets of the EU countries in order to ensure affordable, safe and sustainable energy to all citizens. In this context, there are new projects for carbon capture and storage and also projects to boost renewable energy to the industrial and social activity.</p> <p>Furthermore, the competitive prices and the reduced systems costs enable to expect a profitable decarbonization of European energy systems, a sufficient energy supply in the European Union and a more competitive markets.</p>
	<p><b>Innovation and New Technologies</b></p>	<p>During 2015, the investment in R&amp;D increased leading to new technological advances. Both factors have become key elements to improve competitiveness of companies in the sector and create high value-added employment. Thus, the European Union is working to commercialize the new technological developments and foster the use of research in the engineering field. Some advances are such as vending machines that reward recycling (the user enters a waste product at the end of its useful life and the machine returns a ticket discount), new water treatment and waste treatment plants, recycling centers and smart urban services.</p> <p>On the other hand, some companies in the sector are introducing data analysis to interpret the vast amount of data from its manufacturing operations and customers. This allows them to improve their presence on social networks in order to adapt to new customer service and anticipate their needs by offering more customized and personalized services.</p> <p>Furthermore, new communication platforms such as social networks have become a good tool to improve relations with customers, optimize brand reputation and increase the impact of marketing campaigns.</p>

## 04. Employment in the energy and water sector

The Energy and Water sector has continued generating employment during 2015. In particular, it has increased the demand for professionals with business skills as energy advisors/commercials. It has also slightly increased the demand for professionals with technical and project management skills. Thus, the engineers are the group of professionals with more job opportunities in the energy and water market.

On the other hand, it is expected that demand for both high-qualified and less-qualified professionals will increase in coming years due to active policies on energy and water as well as the transition to a new energy model. Likewise, experts foresee that more companies will require engineers to manage international projects linked to energy efficiency and renewable energy.

Analysis of employment in the Energy and Water Sector	Current situation	Forecast growth
	↑	↑

↑ Recovery/Growth; ⇌ Maintenance; ↓ Decrease

### 4.1. THE MOST REQUIRED HIGHLY-QUALIFIED JOBS

	Job Position	Description	Requirements valued ( Education, experience and skills)	Additional considerations
1	<b>Site Contract Manager</b>	The site contract manager is the professional responsible for managing contracts, the human capital and other requirements to be met in international projects. It is also responsible for controlling various functions such as budgets, costs, resources, etc.; and to coordinate relations with the customer, suppliers and subcontractors.	<ul style="list-style-type: none"> <li>Education: an engineering degree is required.</li> <li>Experience: a minimum experience of 8 years managing international projects is highly valued.</li> </ul>	Sector companies consider skills such as <a href="#">negotiation</a> , <a href="#">learning</a> and <a href="#">orientation towards achievement</a> .
2	<b>Engineering Project Manager</b>	The engineering project manager is the professional responsible for planning and scheduling tasks and coordinate the activities of each project. He/she also controls if the project is carried out under the technical guidance and within budget.	<ul style="list-style-type: none"> <li>Education: an industrial engineering degree is required.</li> <li>Experience: a minimum experience of 5 years in similar positions of the same sector is highly valued.</li> </ul>	Any specific training projects related to water desalination and reuse are valued.

	Job Position	Description	Requirements valued ( Education, experience and skills)	Additional considerations
3	<b>Renewable Energy Auditor</b>	The renewable energy auditor is the professional responsible for studying the equipment and processes that consume energy in an industrial process, building or urban plan and evaluate this consumption. It also makes proposals and recommends efficient technologies and renewable energy sources.	<ul style="list-style-type: none"> <li>• Education: an industrial engineering degree is required.</li> <li>• Experience: it is required to have a minimum experience of three years in similar positions in the energy efficiency and management field.</li> </ul>	<p>Sector companies value skills such as <a href="#">analytical thought</a>, <a href="#">initiative</a> and <a href="#">team work and cooperation</a>.</p> <p>High level of English is a must. Sometimes, other languages such as French are also required.</p>
4	<a href="#">Senior Energy Efficiency Technician</a>	The senior energy efficiency technician is the professional who work on process systems engineering tasks at industrial production plants. Thus, he/she is involved in the execution of projects to improve the energy efficiency of industrial production plants by implementing improvements, including the use of renewable energies instead of traditional sources of power.	<ul style="list-style-type: none"> <li>• Education: either a professional training course in the field of energy and water or a higher industrial engineering are required.</li> <li>• Experience: three years of previous work experience in tasks related to energy saving is required.</li> </ul>	<p>Good methodology in the application of techniques related to energy saving and efficiency is a plus.</p>

	Job Position	Description	Requirements valued ( Education, experience and skills)	Additional considerations
5	<a href="#">Electricity Market Analyst/Operator</a>	The energy market analyst/operator is the professional responsible for drawing up the system's daily operating schedule, balancing the supply and demand offers that reach them, under the supervision of a commission of representatives of qualified producers, distributors, suppliers and consumers.	<ul style="list-style-type: none"> <li>• Education: a degree in either engineering, architecture, mathematics or business is required.</li> <li>• Experience: near two years of experience performing similar tasks is required. Experience in tasks of an analytical nature is also desirable.</li> </ul>	Skills such as : <a href="#">planning and organization</a> and <a href="#">concern for order and quality</a> are required.
6	<b>Quality and Environment Technician</b>	The quality and environment technician is the professional responsible for the preparation of quality plans, inspection programs, waste management, etc. Furthermore, imparts internal training and propose company objectives.	<ul style="list-style-type: none"> <li>• Education: a degree in engineering is required. In addition, it is recommended to have knowledge of the legislation and standards of the industry specific ISO.</li> <li>• Experience: three years of previous experience in similar positions in the energy and water sector is highly valued.</li> </ul>	Professionals with knowledge in software programs and Microsoft Office as well as technical matters are desirable.

## 4.2. THE MOST REQUIRED LESS-QUALIFIED JOBS

	Job Position	Description	Requirements valued ( Education, experience and skills)	Additional considerations
1	<a href="#">Wind Farms Operator</a>	The wind farm operator is the professional who carries out the operations related to the assembly and maintenance that ensure the correct running of a wind farm, assessing and preventing possible professional risks.	<ul style="list-style-type: none"> <li>• Education: it is necessary to have a professional training course in either the renewable energy field or the design in mechanical manufacturing.</li> <li>• Experience: previous work experience of one or two years in renewable energy systems (thermal and photovoltaic) and in operation of wind turbines is required.</li> </ul>	Technical knowledge is needed to adjust and configure machines, review technical equipment and detect incidents in the operation.
2	<b>Energy Commercial</b>	The energy commercial is the professional in charge of capturing and recovering customers. It performs sale tasks; presentation of services, business proposals and monitoring of services offered.	<ul style="list-style-type: none"> <li>• Education: it is necessary to have minimum compulsory education.</li> <li>• Experience: minimum experience in sales in Energy and Water sector is required.</li> </ul>	A good communication skills, motivation and orientation towards achievement are valued.
3	<b>Plant Operator</b>	The plant operator is the professional who is responsible for controlling and monitoring the electro-mechanical plant operation and its maintenance.	<ul style="list-style-type: none"> <li>• Education: a professional training in electricity and electronic.</li> <li>• Experience: one year of experience in similar positions in the energy and water sector companies is required.</li> </ul>	It is advisable to have knowledge of basic computer tools. Furthermore, a medium-high level of English is required.
4	<a href="#">A Water Distribution and Sewage System Operator</a>	The water distribution and sewage system operator is the professional who is actively involved in the assembly, commissioning, operation and maintenance of water supply and distribution networks, as well as the installation and maintenance of treatment networks, ensuring the quality and safety required and complying with current regulations.	<ul style="list-style-type: none"> <li>• Education: a professional training course in electrical installation is required.</li> <li>• Experience: a minimum work experience of two years in water maintenance is required.</li> </ul>	Skills such as <a href="#">concern for order and quality</a> and <a href="#">analytical thought</a> .

## 5. Conclusions and future prospects

### New opportunities



- Actions related to energy efficiency are the main opportunities for business development and expansion in the sector for all entrepreneurs, freelancers and SMEs.
- Wind energy, the most advanced technology of renewable energy, plays an important role in electricity supply around the world, in Spain and Catalonia, as well as the decarbonizing of the electricity sector, a key factor in the fight against climate change. In turn, the Global Wind Energy Council estimates that by 2030 wind power can supply around the 17-19% of global electricity demand and will create more than two million jobs.
- Experts predict an increase in competition due to the innovations in the technology sector, electrical engineering and telecommunications in the field of energy and water. In this situation, companies are required to collaborate with companies in other industries to improve and incorporate technological advances to its business model.
- Regarding the transformation of the energy market, companies are adapting and even creating new business models in order to respond to the realities of markets and regulations of each country. The main objective is the business operational area as it will have changes and advances, according to industry experts. Thus, by the year 2030, there will be an increase in infrastructure development related to Smart Cities, Smart Homes and Smart Communities.

### The professionals in the Energy and Water sector



- Increasingly, the training programs related to both treatment and water management is specializing in new technologies in order to train professionals according to new industry trends as all companies demand.
- It is expected that the growing transverse activities of the sector to others ones such as the ICT sector. Therefore, it will imply that IT professionals might be in high demand by the companies of Energy & Water sector.
- The EU commitment to improve the academic qualifications and skills of less-qualified workers of the energy sector through the approval of new certifications such as solar field operator. The aim is to increase academic recognition, even internationally, to facilitate their labor mobility.
- Flexibility and change management are the most demanded skills for high-qualified professionals. Furthermore, experts with international profiles (knowledge of other markets and high level of English) are highly valued for managing energy and water projects in other countries.

## Alerts



- The water sector in Spain faces a number of important and urgent environmental challenges (water shortage and breach of European regulations) and economic challenges (lack of investment and insufficient rates to recover the costs incurred in the water services). For this reason, the sector demands a legislative and regulatory framework that provides stability and attracts investment.
- Head of governments, business leaders and investors in the sector will have to work together to mitigate greenhouse gas emissions; they must finance actions to limit the effects of climate change and promote sustainability.
- The International Energy Agency estimates that investment in optimized and intelligent network infrastructure will grow in the coming years in order to solve the current limitation on creating global transmission networks to integrate renewable energy sources. In this way they may replace aging infrastructure.
- Companies and investors in the sector are exposed to the variability of energy prices and the wide range of regulatory requirements they must meet. Also, these companies and freelancers have to meet the objectives of the Spanish and European energy policy (emissions targets and climate change, price and rates requirements).

## Strengths



- There are high-qualified professionals in the energy and water sector level. Moreover, public institutions are committed to improve and continue to increase training offers and professional certifications.
- The energy supply in Spain has evolved in recent years towards a more diversified and balanced structure, with a growing share of renewable energies and natural gas against more polluting conventional energy.
- Catalonia is positioning itself as a leading region within the Spanish energy market in research of new technologies that enable more efficient use of energy.

**The training and certification of new specialized areas to professionals in the sector can increase their employment opportunities in the coming years and contribute to the competitiveness of enterprises.**

## 06. Articles and consulted reports

**Sources:** IDESCAT; INE; Ministry of Industry, Energy and Tourism Spain; Instituto para la Diversificación y Ahorro de la Energía IDEA; Institut Català d'Energia ICAEN; Energy report Spain 2014.

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(2015). “ La aportación de las energías renovables al PIB cayó un 22% en 2014, hasta los 7.387 millones”.  
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Tapiador,T.(2015). “Contra reloj para subirse en la ola de las grandes”. *Cinco Días.*

Mosquera,P. (2015). “La eólica cubre ya el 4% de la demanda mundial de energía”. *Energías Renovables.*

## 07. Sectorial complementary Webography

✓ Institut Català d'Energia

<http://www20.gencat.cat/portal/site/icaen>

✓ Associació de Professionals de les Energies Renovables de Catalunya

<http://www.aperca.org>

✓ European Renewable Energies Federation

<http://www.eref-europe.org>

✓ Información Sectorial: Agua

<http://ue.iagua.es/>

✓ Institut Català de Recerca de l'Aigua

<http://www.icra.cat>

✓ International Energy Agency

<http://www.iea.org/>

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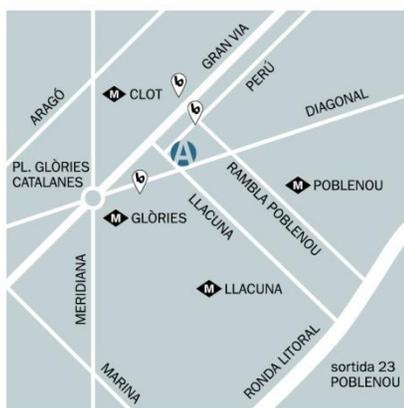
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