



## CURRENT RENEWABLE ENERGY SITUATION IN THE PROVINCE OF LEÓN

Spain currently has a favourable political regulatory framework in terms of dealing with the climate emergency and expediting the energy transition. It has also set the benchmark in adopting a series of strategies and mechanisms to protect vulnerable territories and populations and press forward with social justice criteria.

An analysis of the current capacities and assessment of the growth forecasts for the renewable sector in the province of León are extremely useful in identifying and predicting the best strategies to ensure widescale deployment of these technologies with the greatest co-benefits and social protection. The experience of this province can also serve to assist other territories both in and outside of Spain which are undergoing similar energy transition processes.

The province of León currently has the following strengths which favour the growth of the renewable energy sector:

- There is less installed capacity than in other provinces of Castilla y León and yet the sector provides a lot of industrial employment in the sector.
- It is home to companies in every technology area: wind power, photovoltaic solar power, solar thermal energy, hydraulic energy and biomass.
- As well as throughout the value chain: manufacture of components, pellet production, distribution, design and engineering, development, installation, operation and maintenance, training...
- R+D+i. The region houses large manufacturing companies in the wind and photovoltaic sectors, with significant investment being made in research. There are also several public-run centres for basic and applied research
- Public entities which support energy transition and training. In this regard, the relatively small province is home to the headquarters of the *Ente Regional de la Energía de Castilla y León (EREN)*, the *Ciudad de la Energía (CIUDEN)* and the *Fundación Santa Bárbara*, organisations that will play a fundamental role in the region's energy transition.



The current status of each renewable energy technology in the province is as follows:

- Wind: Wind power capacity of 439MW, and 769 MW capacity currently in the pipeline, a 75% increase in current power capacity.
- **Photovoltaic solar:** 42 MW installed capacity. 3.647 MW in the pipeline, well above the autonomous region average. Not all the power currently planned will ultimately come to fruition in terms of installed capacity but it does provide an idea as to the levels of interest in said technology in the region.
- **Self-sufficient supply:** Castilla y León and the province of León in particular, is emerging as one of the regions with the greatest potential for electricity self-consumption in the form of photovoltaic solar power, enjoying 2,727.3 hours of sun per year, higher than the national average (2,588). Self-consumption is currently more prominent in the industrial sector than residential, with installations in the food industry (both production and processing), the manufacturing and pharmaceutical sectors, service stations...
- **Biomass:** There is one electricity production plant Cubillos del Sil (50 MW). Due to the environmental precautions entailed in burning biomass for electrical purposes, its use for thermal purposes should be prioritised, especially given this is where the use of other renewable technologies is more difficult. In the residential sector, Castilla y León ranks as the second Autonomous Community for domestic-use biomass installations. There are currently 7,600 modern biomass heating appliances. The use of biomass extends to urban district heating (León and Ponferrada), heating of public buildings and industrial facilities.
- **Hydroelectric**: 34.74 MW Small Hydro+ 508.11 MW Hydro. This technology has lower growth expectations due to the limitation of resources. In the coming years, we will have to manage the end of grants for many of these kinds of plants. Micro hydro-electric plants are being installed to take advantage of waterfalls in disused mines. These are pumped-storage power plants which improve management of the resource and also have solutions to purify the water that builds up in the mines and contains heavy metals, causing serious environmental issues.
- Solar thermal: Castilla y León has 170,426 m<sup>2</sup> installed capacity (69,6 m<sup>2</sup>/1,000 inhabitants), ranking it among the top Autonomous Communities in Spain in terms of capacity per capita. Data broken down by province in not available.



### Existing electrical power output and capacity envisaged or in the pipeline (MW) by energy source in the province of León, July 2020

Source: Prepared by authors based on EREN data

# EMPLOYMENT

The estimated total employment is 2,069 jobs and turnover for the analysed companies is some 244 million euros, led by the wind power sector. This is a very male-dominated area, with just 20% of jobs being filled by women. The manufacturing companies in the wind energy sector account for 75% of the total employment, with most jobs being of an industrial nature. The companies specialising in biomass are the most intensive employers.

The fact this employment is restricted to the activities which are most closely related to energy generation using renewable sources must be taken into account. Employment resulting from the energy transition will undoubtedly be much greater. On the one hand, jobs in training and awareness-raising, as well as public employment aimed at promoting these energy sources have not been considered. Meanwhile, employment linked to smart grid management, strengthening the power grid and energy storage has not been taken into account. All these activity areas will grow out of necessity as the energy transition progresses.

#### Jobs by renewable technologies in the province of León

Wind	1,564
Photovoltaic	93
Biomass	394
Solar thermal, geothermal and hydroelectric	18
TOTAL	2,069

#### Source: Prepared by authors

#### Estimated jobs per activity type in the province of León

TOTAL	2,069
Collecting raw materials & distribution	300
Operation & Maintenance	123
Promotion & Installation	42
Manufacturing	1,604

#### Source: Prepared by authors

Employment growth forecasts in renewable technologies are optimistic. ISTAS (Trade Union Institute of Work, Environment and Health) estimates the creation of 1,719 direct new jobs in the province of León, based exclusively on the renewable energy power values currently in the pipeline. This is a business as usual scenario taking into account the renewable auctions already held which are indicative of the sector's positive evolution. Nevertheless, the potential employment linked to the new renewable power from now to 2030 will be much greater.



## STATUS OF INDUSTRIAL FRAMEWORK LINKED TO RENEWABLE ENERGIES

Analysis of the current capacities and the existing business structure leads us to conclude the importance of directing resources and funds for a just energy transition, first and foremost, to strengthening the activities and competition of the existing local renewable sector in the area. Secondly, we must try to maximise pathways for new investments and the opportunities to broaden business creation and professional ventures.

### Wind energy

- The production capacity of wind power technologies is notable, having a significant impact in terms of activity and employment in relation to the total volume of business derived from exploiting the installed capacity in the region.
- The wind power sector in Castilla y León has demonstrated strong leadership and industrial capacity within Spain as a whole. The province has its own manufacturing and maintenance industry for components, transformers, electronics, multipliers, generators, hydraulic installations. Castilla y León is a leading region in terms of the number of manufacturing facilities for wind power components within the framework of carbon transition regions in Europe, with 25 facilities, 4 of which are located in León. Special mention should be made of LM Windpower of the General Electrics group, the most significant in terms of employment volume as one of the companies headquartered in the province with the greatest number of employees.

### Photovoltaic solar energy

- Production of photovoltaic cells and panels is almost non-existent in large parts of Spain. However, in early 2020, the Escelco Solar Company's new production plant in León began producing 100% Spanish-manufactured solar modules.
- Another significant plant within the sector in the province is Censolor, a facility which centralises the support services for Indra's renewable energies, located in San Román de Bembibre.
- Companies producing auxiliary components such as metallic structures and small-scale electrical equipment make up the rest of the province's industrial activity in the photovoltaic sector.

### **Biomass**

- There are two pellet production plants in the province of León, Biovegamasa and Coterram, both of which are less than 10 years old. They produce a combined total of 30,000 tonnes per year, what is essentially mid to small-scale production. These pellets are for domestic use. Each of these plants has an average of between 15 to 20 associated companies distributing the pellets, largely SMEs and micro SMEs. There is also a pioneering company on a national level, Calor ERBY in Ponferrada.
- The experience of the Lamelas Viloria Group is a perfect illustration of a family business group with a long history in the coal industry undergoing a conversion process which has seen them make a concerted effort to diversify their activities towards the renewable energy sector since the year 2000 and adapt to the new energy transition scenario. They are currently developing projects in wind power, photovoltaic solar power, mini-hydraulics and biomass both in the region and beyond.



## PUBLIC ENTITIES, TRAINING AND R+D+i

- There are currently three public entities in León carrying out functions linked to promoting energy transition, research or training in the territory. These are *Ente Regional de la Energía (EREN), Fundación Ciudad de la Energía (CIUDEN)* and *Fundación Santa Bárbara*. These three bodies must play a leading role in expediting a just energy transition across the whole region. For instance, the *Fundación CIUDEN* and the *Fundación Santa Bárbara* have agreed on a collaboration protocol which includes joint actions aimed at driving the just transition and promoting the economic and social development as well as stimulating employment in the mining regions.
- Investment in R+D+i by renewable energy companies in Spain are well above the national and European average. In 2018, investment hit 3.07% of direct contribution to national GDP, equating to almost three times more than the Spanish average (1.20%).
- On a business level within the province of León, production companies such as Escelco and Censolor (photovoltaic), LM Wind Power (wind) and Biovegamasa (pellet production), are investing in research into products, quality, improving energy efficiency, extending the useful life of different elements, remote monitoring, etc.
- In terms of basic research in the public sector, the University of León plays a crucial role. Several departments have opened lines of investigation into renewable energies. They also collaborate regularly with different companies in the sector to carry out specific applied research projects.
- The Agricultural Technology Institute, *Instituto Tecnológico Agrario de Castilla y León (ITACYL)* works in applied research for the agricultural and agri-food sectors. Within this field, it operates a R+D+I Centre on biofuels, based in Villarejo de Óbrigo (León).
- The Fundación Santa Bárbara is a renowned training centre and a valuable public resource in terms of implementing professional qualification and retraining programs in the province for the new sources of employment which arise as part of an energy transition.
- In regard to formal training, León does not have any centres which provide specific vocational training programmes based on renewable energies.
- The Plan for the Dynamization of Mining Towns envisages establishing links with other public entities present in the region. One example of the fruits of this collaboration is the agreement reached between the *Fundación Santa Bárbara, CIUDEN* and *Endesa* to offer free training courses in dismantling thermal power plants and ecological transition. A total of 360 students will be trained in the area during 2020 and 2021.



ITACYL Biofuels and Bioproducts R+D+i Centre





Source: ITACYL

## PROPOSALS AND MEASURES TO BOOST GROWTH OF RENEWABLE ENERGIES AND THE ASSOCIATED PRODUCTIVE FRAMEWORK

**Wind power** currently has a significant industrial capacity in León, requiring particular attention in order to support its sustainability and growth. The production plants and associated auxiliary industries are not so much focused on the installation of new power in León, but rather linked to the progress of the wind energy market on a national and international level.

As part of Horizon 2030, the large wind farms will continue to contribute significantly to the new renewable energy in order to reach the goals set out in the PNIEC (Integrated National Energy and Climate Plan), fundamentally via renewable energy auctions.

Investment in new farms is expected in the province of León through future renewable energy auctions, and along with that will come the complementary measures in order to prioritise development in the just transition areas.

Finally, the sector does require unwavering public support in order to push forward in the small mid-power facilities most appropriate for industrial or municipal self-consumption, as well as to promote hybridisation with photovoltaic solar technology.



As regards **photovoltaic solar energy**, the capacity volumes currently in the pipeline in the province of León is testament to the maturity and profitability of the large plants in the territory. It's a trend that is apparent throughout the Spanish market and one which is expected to continue in order to meet the national commitments on the penetration of renewable energies.

Another segment which is growing and has very positive evolution forecasts for the coming years, is self-consumption. These kinds of facilities are hugely beneficial in employment terms as they are more labour intensive than the large plants, while they also generate economic activity spread throughout the territory. Self-consumption has also been consolidated as a tool to boost the efficiency, sustainability and financial competitiveness of the companies who opt to use it.

There is a clear need to support hybridisation systems with wind power and/or surplus storage systems, as well as the growth of photovoltaic-based energy communities and complementarities with agriculture ("agrovoltaic or agrophotovoltaic") and floating reservoirs and basins.



In terms of **biomass** energy, it is becoming apparent that the large plants are neither sustainable from an environmental perspective, nor financially viable. The size of biomass power plants must be limited in order to achieve supply using local fuel (which will vary depending on the area but could be situated at around 20MW).

In any case, the proposals set forth are geared towards prioritising biomass for thermal use, particularly in the industrial and business sectors and cogeneration, over electricity generation exclusively. There have also been very specific proposals to develop urban or industrial district heating systems due to their superior efficiency and significant co-benefits compared to individual systems.

Finally, the growth of the biomass sector requires good balance between local supply and demand. As such, it is crucial from a supply point of view to boost the provision of local fuel by increasing the exploitation of biomass waste from the agricultural or agri-food industries, the pruning of parks and gardens, or clearing brushland.



As regards **hydroelectric energy**, there is little margin for growth in terms of new electrical projects. However, the interest in renewing any grants which expire in the coming years should be assessed on a case by case basis in order to ensure they continue. The award of grants to local organisations and citizen cooperatives should be promoted.

The current situation in relation to **solar thermal energy** is not dissimilar to the rest of the peninsula. The sector's public image has taken a real blow. Existing facilities were developed as a response to demands of previous technical building codes and the majority are functioning well below optimum levels. In that regard, an effort must be made to guarantee the quality of the facilities, as well as their operation and maintenance. In any case, growth perspectives here have been reduced largely because it is now competing with a more cost-effective technology in the form of photovoltaic solar panels on buildings. However, measures such as including greater requirements for its installation in refurbishment of buildings could ensure its growth is not quite so constrained by new builds. Furthermore, greater penetration of this technology should be fostered in high ACS-consuming public buildings, such as sports centres, indoor swimming pools, etc.



### **Cross-sectoral measures**

- **1.** Relaunch the industry as a driving force for highquality employment and business relocation. Promote national manufacturing of goods and equipment related to the extensive deployment of renewable technologies set to occur in the coming years under the PNIEC. In order to achieve this on a national scale, the following proposals have been set out: ensure that the upcoming Spain Industrial Strategy 2030 contributes; draw up an Industrial Development Plan for Renewable Energies; include weighting of the carbon footprint in renewable energy auctions for any projects. On an Autonomous Community level, an Industrial Promotion Plan should be drawn up which begins by supporting the existing companies and specifically serves to drive and assist SMEs in the auxiliary components and repair industries.
- 2. Strengthen Autonomous Communities' planning around renewable energy, ensuring mandatory targets are set for the integration of renewable thermal and electrical energies, and new strategies and specific measures are adopted for each renewable technology reflecting the financial resources available.
- **3.** Develop an Autonomous Just Transition Strategy which provides a prior assessment of the envisaged impact and develops proactive long-term solutions in the region.
- 4. Encourage electricity companies to invest in renewable projects in the province of León on the basis of a strengthened tripartite social dialogue and ensure monitoring of the measures adopted to keep employees of the contracted companies in work in these transition regions.
- Foster a rural development model based around renewable energies, with a particular emphasis on strengthening those projects linked to the use of agricultural, farming or forestry waste for energy purposes.
- 6. Promote bilateral long-term power purchase agreements, opening them up to new stakeholders and activating funding for new projects.

- 7. Support research, development and technological innovation in the field of renewable energy to ensure equipment manufacturers and technological application companies capitalise R+D+i investments through a policy of continuous improvement, supporting the existing research centres in order for them to assist companies who do not have their own resources; and facilitate access to funding for all stakeholders and establish specific measures to bolster the activity of entrepreneurs and spin-offs.
- 8. Improve systems for training and qualifying human capital to facilitate employability. In the province of León it is particularly important to include Advanced Vocational Training Programmes: "Advanced Renewable Energies Technician", "Energy Efficiency and Solar Thermal Energy" and "Electrical Plants". The training plans at the Fundación Santa Bárbara and CIUDEN must also be renewed in order to focus them more at new business niches, particularly in the renewable energy and energy efficiency sectors.
- Strengthen local railway, logistical and telecommunication infrastructures in order to facilitate the relocation of businesses, particularly those in the field of component manufacturing.
- **10. Measures to aid companies' internationalisation,** such as making more financial tools available in order to facilitate exports, dissemination campaigns helping companies to take part in contract adjudication procedures by multilateral bodies, the creation of sectoral programs to drive into foreign markets, promoting clusters as facilitators.
- 11. Promote the implementation of renewable technologies on municipal land and encourage collaborative practices between neighbouring municipalities in order to share the benefits of facilities (associations). The derived revenues could be allocated entirely to energy transition measures established in part by the local population, or for refurbishing homes.



### **Promoting self-consumption**

- **12.Speed up the integration of renewable energies in public buildings** (schools, hospitals and health centres, residences, sports centres) in order to set an example and bring the business and domestic centres along with it. The use of these technologies could provide electricity from renewable sources to nearby residential buildings, therefore also acting as a tool to combat energy poverty.
- Strengthen communication channels, awarenessraising and publicity about the benefits and return on self-consumption investment for citizens and businesses.
- 14. Promote shared industrial self-consumption through energy communities on industrial estates. A National Self-Consumption Strategy is proposed, while on an autonomous community level, specific objectives must be set by subsector. Dynamic coefficients could also be implemented for shared self-sufficient supply.
- **15. Ensure the quality of self-sufficient facilities to breed confidence among users**. To do so, business associations from the sector must continue working on developing quality seals which accredit photovoltaic solar energy standards.
- **16.** Prioritise public support for self-sufficient facilities with electrical storage, less economical in the majority of cases.



### Specific measures for electricity generation technologies

- 17. Modify the current auction system for new renewable power sources in accordance with the proposals of the Draft Royal Decree governing the renewable energy economic regime for electricity production facilities. It must take into account the distinction between technologies, sizes and manageability levels, providing for location criteria and compensation for territories affected by the just transition, as well as incorporating other criteria such as the projects' carbon footprint in order to incentivise industry and local job creation.
- **18. Continue and strengthen development of the electricity grid** in order to integrate renewable electricity generation and make progress in digitalisation and smart management.
- 19. Revise the electrical tariff structure to promote energy saving, self-consumption and demand management, reducing the weighting of fixed costs in the final cost of electricity.
- 20. Promote and facilitate the repowering of wind farms at the end of their useful lives, which would provide

an estimated 3,000 MW per year on average in Castilla y León from 2025 by simplifying administrative procedures with specific policy developments. Another option to consider would be a mechanism by which repowering is favoured in renewable energy auctions.

- **21.** Public grants to promote recycling and refurbishment of wind turbines in order to improve the sustainability and circularity of the facilities.
- **22. Continue with the grant system for small-scale hydroelectric generation**, analysing maintenance possibilities of existing small hydraulic facilities and promoting the award of grants to local authorities and citizens' cooperatives.
- 23. Actions in support of using biomass for electrical generation, based on sustainability and energy efficiency criteria such as local biomass provision without compromising other ecological and economic functions in the territory, and always with a focus on using a combination of heating, coooling and power wherever possible (co-generation, tri-generation).

### Specific measures for heating & cooling system

- 24. Promote the use of biomass to satisfy industrial heating demand, in particular in the production and processing of corn and hops which are crucial crops for the territory. In order to improve returns on the grain driers which are only used certain months of the year, other complementary thermal applications should be sought (drying other food products) or the activity could be extended throughout the rest of the year. Other proposals include tax breaks, such as the reduction of VAT on biofuels or property tax cuts for companies which implement biomass facilities.
- **25. Strengthen industrial district heating by way of state participation and direct investment aid**. Castilla y León is home to the district heating system at the Villalonquéjar industrial estate (Burgos) with a trigeneration plant powered by biomass and photovoltaic solar energy which supplies power to 4 companies on the estate. A pilot project could be undertaken at the El Bayo industrial estate (Cubillos del Sil) which already has a biomass power plant and industrial district heating could be developed.
- 26. Encourage the integration of renewable energies in public buildings as a way in which to expand urban district heating and collective facilities. First and foremost, by promoting exclusively renewable collective central heating and hot water systems, particularly using biomass, both in new constructions and in any energy rehabilitation projects or public works. Secondly, by putting state-led plans in place to promote renewable thermal energy —like the Programa Hospisol which installs solar thermal energy in hospitals- in public-owned buildings or facilities such as schools, heated halls, retirement homes. These facilities would be the base on which to develop urban district heating systems which also service private residences. Finally, a proposal for the new regional heating and cooling strategy could force town councils to use pruning waste gathered from parks and gardens for biomass purposes.

- 27. Plans to replace boilers in cities and limitation of public support for exclusively renewable power installations. The replacement of coal-fired boilers still in use in cities such as León and Ponferrada is particularly urgent.
- **28. Develop the quality of the biomass sector throughout the value chain** in order to facilitate its long-term viability and growth. In order to optimise the functioning of the facilities, three action areas must be addressed: quality of the fuel (raw material certification standards such as EN.Plus and PEFC), the quality of the equipment and standardisation of the facilities (ecodesign legislation) and the maintenance of the facilities ("Accredited biomass installation technician"). Renewable energy auctions, financial grants or government procurement undertaken by different public administrations must be based on compliance with these quality requirements.
- 29. Promote the figure of Energy Service Companies as facilitators for the growth and improved functioning of renewable technologies in certain market niches. An illustration of this is the need for these kinds of companies to support the monitoring and maintenance of solar thermal facilities which are currently operating at less-than-optimum levels. Technical support and funding possibilities provided by the Energy Service Companies can help to accelerate the installation of renewable thermal energy sources in buildings and industry.
- **30. Drive public energy rehabilitation plans in both the public and residential sectors,** with a particular focus on the vulnerable population, meaning the deployment of renewable heating and cooling systems are not aimed only at new-build constructions.
- 31. Dissemination and awareness-raising campaigns aimed at promoting these technologies in residential and industrial sectors.





Publisher: Instituto Sindical de Trabajo, Ambiente y Salud (ISTAS) Authors: Sara Pérez Díaz & Begoña María-Tomé Gil With the support of the **European Climate Foundation** Graphic Design: Pilixip Translated by Nick Purdue Date: July 2020

The opinions and documentation contained in this report are the exclusive **responsibility of the authors and do not necessarily reflect the positions** of the entities which have provided financial support for the project.