

## Spain distributed energy systems

In 2016, the International Energy Agency (IEA) gave us the good news that electricity generation from renewable sources had reached its maximum power ahead of coal and other technologies. This was mainly due to high investment in solar and wind energy in China, India and the United States.

Its study entitled “Medium-Term Renewable Energy Market Report”, indicated that in the next five years renewable energies would continue to be the fastest growing source of electricity generation, increasing from 23% of electricity generation in 2015 to 28% in 2021.

This growth would be different around the world and each country would have to promote policies for its sustainable development beyond market forces. The Paris Agreement provided a global boost for these energies and, with ongoing concern for air quality at an urban level, new lines of action were developed that highlight the importance of the development of renewable energies at urban and rural levels.

In this regard, Distributed Generation (DG), a concept is based on “the provision of electricity, changed from a centralised generation system to one that incorporates many small sources of generation (usually renewable) and installed close to the consumption point”, and became the great alternative for the promotion of renewable energies in the coming years. We should not forget that the DG needs to “incorporate modern technology and have the support of the network of consolidated electrical systems”.

Spain and Latin America have had to face different regulatory and market challenges for the development of renewable energy projects. Spain, after having been an inherent leader in renewable energies, has had to struggle in recent years against regulations that prevent new developments, processes and innovative business models.

Whilst Latin America has had to fight against high energy subsidies, against projects that are not financially sustainable, and especially against large hydroelectric plants, where the social-environmental aspects of their construction generally have secondary consideration. However, distributed generation in Latin America still has a high potential for development.

IRENA, the International Renewable Energy Agency, in a study on the Renewable Energy Market in Latin America, establishes the new emerging trends for renewable energy projects in the region. Most importantly these are energy safety and security, access to energy in isolated areas, environmental sustainability and economic competitiveness in a growing region.

In Latin America, investments in renewable energy totalled 80,000 million dollars between 2010-2015. Most projects have been in wind and solar energy, much more than in small and large hydroelectric plants.

This value continued to grow until 2021, especially in offshore solar and wind projects. So renewable distributed generation could be considered to be an important alternative for energy sustainability in the region, especially because of the following:

In Spain, where the indexes for meeting electricity demand reach almost 100% and the electricity system is mature, distributed energy from renewable sources is presented as an alternative for decentralised systems and self-consumption, especially at the urban level.

This type of energy generation needs to fight against restrictive regulatory frameworks and taxes that make its deployment increasingly more difficult. However, electricity distribution companies like Endesa are working to integrate this type of energy into their Smart grid projects at a local level. Even the grid operator, Red Eléctrica de España, is promoting activities to be able to achieve a more natural integration of renewables into the grid.

In the future, the new digitalisation trends in the electricity sector, the global targets for decarbonisation and the vision of a single energy market in Europe will somehow promote distributed generation projects and initiatives in Spain. The same is happening in Latin America, a region where there are many opportunities to promote this type of energy in its territory. The following deserve special mention:

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