



Newsletter

Issue 2, September 2014



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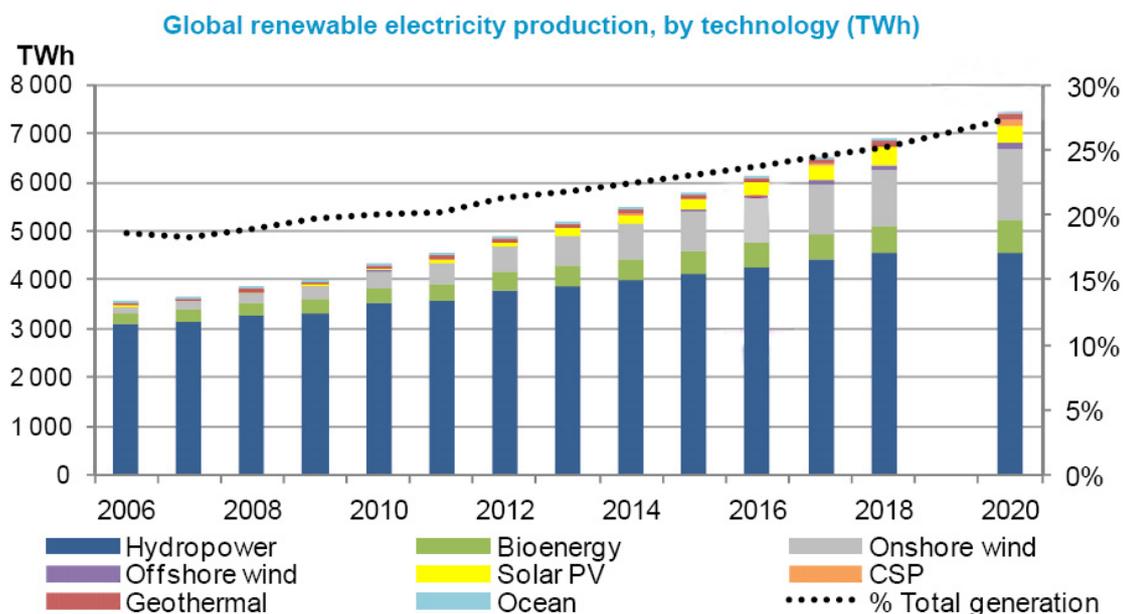
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What is REELCOOP ?

REELCOOP (REnewable ELectricity COOPeration) is a EU/FP7 funded project aiming to develop renewable electricity generation technologies and promoting cooperation between EU Partner Countries and Mediterranean Partner Countries, which started in 1 September 2013, with a duration of 4 years.

You are welcome to visit us and find more details at www.reelcoop.com

Renewable electricity in the World

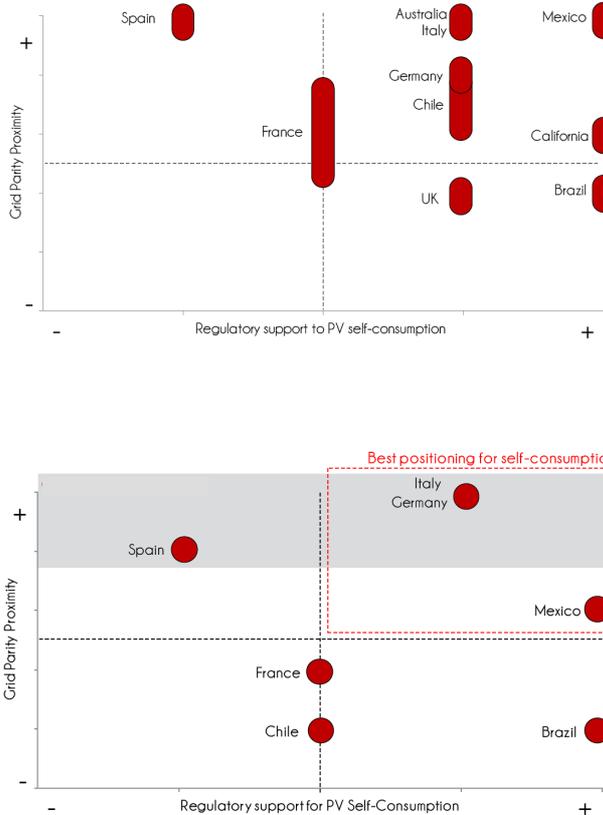


A study of the International Energy Agency shows that the role of renewable sources in the global power mix continues to increase. On a percentage basis, renewables continue to be the fastest-growing power source. As global renewable electricity generation expands in absolute terms, it is expected to surpass that from natural gas and double that from nuclear power by 2016, becoming the second most important global electricity source, after coal. Globally, renewable generation is estimated to rise to 25% of gross power generation in 2018, up from 20% in 2011 and 19% in 2006. Driven by fast-growing generation from wind and solar photovoltaics (PV), the share of non-hydro renewable power is seen doubling, to 8% of gross generation in 2018, up from 4% in 2011 and 2% in 2006. In the Organisation for Economic Co-operation and Development (OECD), non-hydro renewable power rises to 11% of OECD gross generation in 2018, up from 7% in 2012 and 3% in 2006.

Source: Int Energy Agency, *Renewable Energy Medium-Term Market Report - Market Trends and Projections to 2018*, 2013.

PV grid parity analyses

Eclareon, a consulting company focusing on the renewable energy and energy efficiency sectors, carried out grid parity studies for PV systems in the residential and commercial sectors, using current system and electricity costs (of 2013) from different countries in the EU and outside EU. In both cases no electricity storage was considered. Besides the levelised cost of electricity (LEC), taking into account initial, operational and maintenance costs, the existing regulatory support to self-consumption was also evaluated.



Residential sector

A standard 3 kW nominal output system was considered in all cases, with 2 different locations (cities) in each country.

In most countries under analysis grid parity has been achieved (at least partial, for higher electricity tariffs) or even surpassed. The exceptions are UK and Brazil, due to high installation prices, but however benefit from a good regulatory support to self-consumption. In the EU, minimum LEC values range from 0.10 €/kWh in Las Palmas (Spain), to 0.23 €/kWh in Berlin (Germany) - among the 5 EU analysed countries.

Commercial sector

A standard 30 kW nominal output system was considered in all cases, with one location (city) in each analysed country.

Italy and Germany are the cases with best conditions for PV electricity. Although PV cost-competitiveness has improved considerably, in several countries grid parity has not been achieved yet. This situation is however expected to improve in the coming years. In the EU, minimum LEC values range from 0.08 €/kWh in Las Palmas (Spain), to 0.10 €/kWh in Munich (Germany) - among the 4 EU countries under analysis.

Source: Eclareon, *PV Grid Parity Monitor Report - Residential Sector*, 2013.

Eclareon, *PV Grid Parity Monitor Report - Commercial Sector*, 2014.

BIPV costs

The use of building integrated PV (BIPV) may further reduce electricity costs. Onyx Solar, a partner of REELCOOP, estimates the cost of electricity generated by a photovoltaic skylight in New York at 0.03 \$/kWh, a value which represents a 75% cut in energy costs in the City. The economic benefit is even more significant when considering that this is the cost for the next 25 years, while grid electricity prices keep increasing at high rates, such as in many EU countries.

Source: ONYX Solar, www.onyx-solar.com, 2014.

News from the market

Termocycle, a partner of REELCOOP, is producing a wind micro-turbine electricity generation system.

Named 4Allwind, it features a vertical axis wind turbine and has the ability to generate up to 12 kW of electricity. It may be installed on poles or rooftops, and has a low maximum rotational speed of 136 rpm, with low noise levels. It is able to operate with wind speeds above 1.5 m/s.

The cost of the system, comprising an inverter, is 24 500 €.

There is also a hybrid version, including 2 kW solar tracking PV modules (with batteries and inverter).



Source: Termocycle, www.termocycle.com

News from research

Novel wind micro-turbine

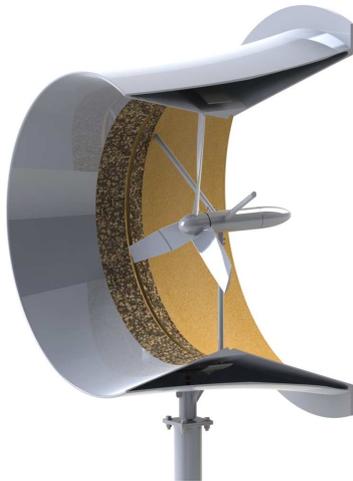
Enhanced WT is the name of a project that developed a novel design of a wind micro-turbine for electricity generation.

It is an horizontal axis turbine, integrating a convergent-diffuser section.

Design characteristics lead to improved efficiency and lower noise levels.

The concept has been developed in Portugal, by a research group at Instituto Politécnico de Bragança. A 1 kW (1.2 m diameter) prototype is under development. The unit is made of cork-based composite materials.

The concept has recently won the best project prize in the ETRERA_2020 competition, in the wind category.



Sources: Windup, www.windup.pt/resources/enhanced_WT_apresentação.pdf
 ETRERA_2020, www.etrera2020.eu

Novel solar thermoelectric generator

A solar thermoelectric generator is a solid state engine that converts sunlight into DC electricity, using the thermoelectric effect.

A research project carried out in USA aims to integrate several state-of-the-art technologies to achieve high efficiency, including next-generation thermoelectric materials, high temperature solar-selective absorbers and thermal cavities.

A first prototype is under development, aiming to achieve a maximum temperature of 1000°C and an electricity generation efficiency of 15%.

Source: ML Olsen et al, Energy Procedia 49, 2014, DOI: 10.1016/j.egypro.2014.03.155