

Renewable Energy Sources in Italy

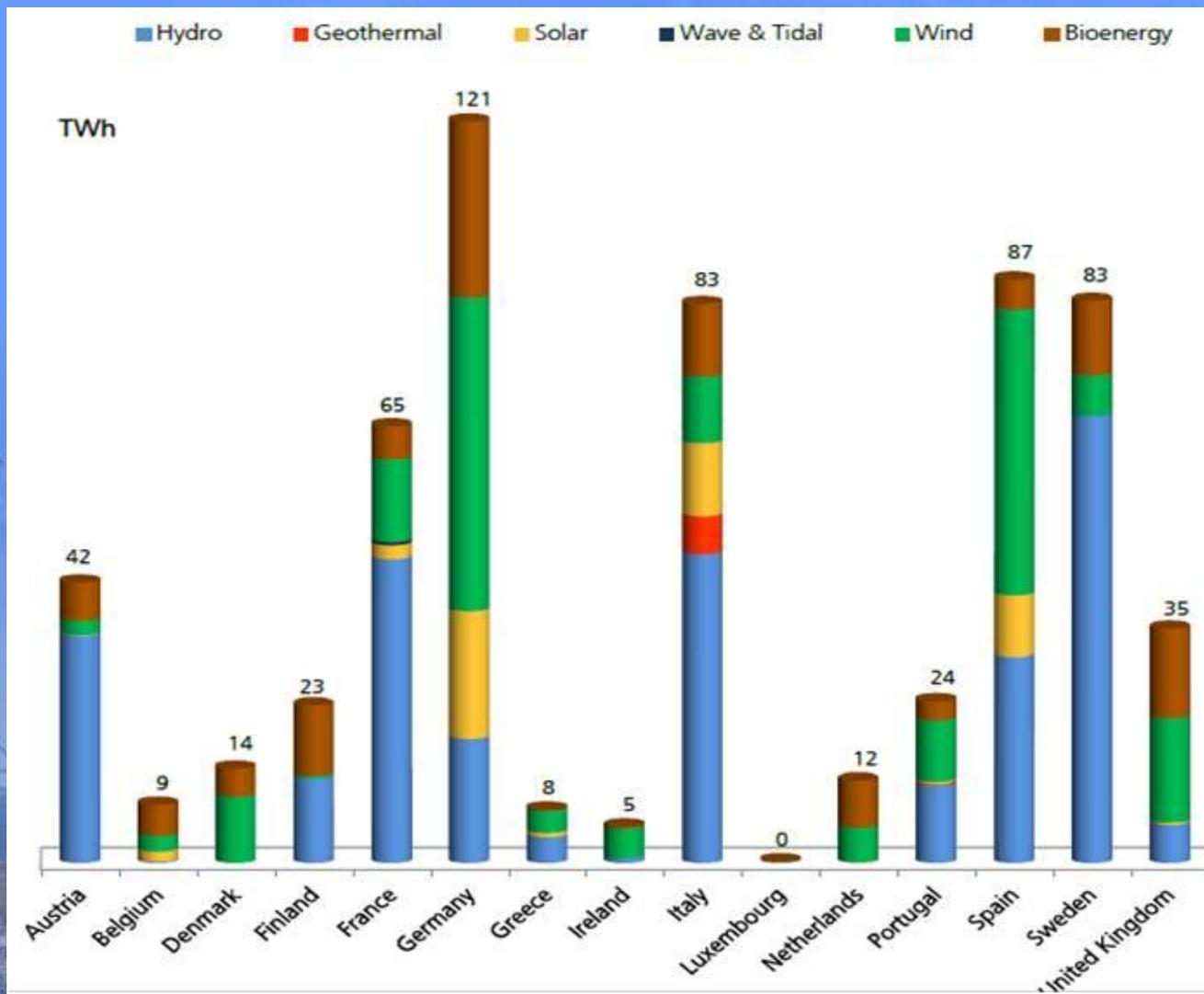
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Italy ranks fifth in the EU for RES-Electricity production

With a yearly electricity production from renewable sources (RES) equal to 83 TWh*, Italy is one of the European leaders in RES-E development. In 2012 Italy invested 14,7 bln \$ in RES - 4th largest investment among G-20 countries

*TeraWatt hour - **TWh**. Unit of energy measurement. 1 **TWh** = 1,000 GWh = 1,000,000 MWh = 1,000,000,000 kWh.



PHOTOVOLTAIC SOLAR ENERGY IN ITALY

Italy has one of the highest energy import dependence rates as compared to other EU member states. Lowering dependence on energy imports and complying with the European 20-20-20 green commitments (20 per cent cut in emissions, 20 per cent increase in energy efficiency and 20 per cent renewables generation by 2020) are two objectives at the heart of Italy's domestic energy policy.

Italy is today a leading producer of electricity from renewable energy sources (RES). The solar photovoltaic (PV) sector has historically been the dominant renewable energy technology in Italy due to the Italian incentive regime for solar PV projects and also to Italy's advantageous geographic position and resulting sun exposure. Solar PV plants located in the south of Italy achieve a very high level of utilization - over 1,500 hours a year - which has led developers from around the world to choose the regions in southern Italy to build some of the world's largest solar PV parks



As of 31 December 2011, the photovoltaic power plants in Italy were 330,196 with an installed capacity of 12,773.4 MW. Respect to the previous year, in 2011 the installed capacity increased by 268.1% while the number of photovoltaic power plants grew by 111.7%. From 2007, the number and capacity of photovoltaic power plants has been increasing exponentially.

At a regional level, 43% of the installed capacity is located in north Italy, 38% in the south, and 19% in central Italy. In just 5 years, production has increased about 280 times and among the sources of renewable energy used in Italy to generate electricity, the contribution of photovoltaic energy is becoming more and more important. Solar energy accounted for 3.2% of the national electricity output in 2011.

WIND POWER



There were 807 wind energy power plants present in Italy at the end of 2011, with an installed capacity of 6,936 MW. Respect to the previous year, 320 new plants were installed (+65.7%), almost all of small size, with an installed capacity of less than 1 MW. From 2000 to 2011 the number of wind farms increased considerably in Italy, even more so in the past few years. At the end of 2000, the power plants were 55 and wind power accounted for just 2% of the renewable energy generation capacity in Italy. In 2011, with 807 plants, wind energy accounted for 17% of the overall renewable energy generating mix.

Due to the environmental and territorial characteristics of the country, 97% of the Italian installed capacity and 76.4% of the power plants are situated in the regions of south Italy, where the strong winds, geological conditions and good access to the sites favour the installation of wind farms. Sicily is the region with the greatest installed capacity, followed by the regions of Puglia and Campania.

As far as electricity generation from wind power is concerned wind energy accounted for 2.9% of the national electricity output in 2011

HYDRO POWER

At the end of 2011, there were 2,902 hydro power plants in Italy with an installed capacity of 18,092 MW. Between 2010 and 2011 the number of plants increased by 6.3%, while the overall installed capacity rose by just 1.2%. The capacity installed in hydro power plants respect to the capacity of the overall stock of renewable energy plants in Italy dropped from 59% in 2010 to 44% in 2011, due to the considerable increase in photovoltaic power generation. Between 2000 and 2011, the number of plants increased at an average annual rate of 4%, while the overall capacity rose at an average annual rate of 1%. In the course of the last few years, hydro power installed capacity has only varied slightly, since in these years many small-sized plants have been built. In the future, the construction of mainly small and mini hydro power plants is expected, in line with the trend of the past years. Notwithstanding the fact that the growth of hydro power is not significant, in 2011, hydro power installed capacity accounted for 43.7% of the overall renewable energy generation capacity.

At a regional level, 80% of hydro power plants are installed in north Italy. In particular, in the three regions of Piedmont (615 power plants), Trentino Alto Adige (602) and Lombardy (418) there are 78% of the power plants present in Italy. As far as the generation of electricity from hydro plants is concerned, in 2011, it produced 13.5% of the national energy output. In 2011, electricity generation by hydro power decreased respect to the two previous years, which were exceptional for the amount of water

BIOENERGY



The term bioenergy indicates energy produced from biomass (including municipal solid waste), biogas and bioliquids. In Italy, there were 1,213 bioenergy plants at the end of 2011 with an installed capacity of 2,825 MW (equivalent to 6.8% of the overall renewable energy generation capacity). In 2011, the number of power plants increased by 81.3% while the installed capacity rose by 20.1% respect to the previous year. Biogas power plants are the most numerous (67%), followed by biomass (22%) and lastly by bioliquid plants (11%). However, when we consider the installed capacity, these percentages change: in fact, biomass, bioliquid and biogas plants account for 46%, 27% and 27% respectively. This is due to the average size of the power plants: biogas plants have an average installed capacity of slightly less than 1 MW whereas those powered by biomass and waste reach an average of about 8 MW. 74.5% of these plants is located in north Italy and in particular, Lombardy is the region with the greatest number of power plants (26.3%), followed by the region of Emilia Romagna (12.7%). As far as the generation of electricity from bioenergy is concerned, it increased by 15% in 2011. Bioenergy accounted for 3.1% of the national electricity output in 2011.

GEOTHERMAL ENERGY

There were 33 geothermal power plants in Italy at the end of 2011 with an installed capacity of 772 MW. Between 2010 and 2011, there was no variation in the number of plants nor in the installed capacity. The 33 power plants are concentrated in just one region, Tuscany.

Geothermal energy sources have been stable in time, accounting for 7% of overall renewable energy electricity generation and 1.6% of national electricity output.



Sunday, June 16th 2013: a historic date to be written in the annals

by Angelo Parisi

What happened? Maybe the Italian national football team won the World Cup? Or maybe Ferrari won the Formula 1 championship? Or perhaps the son of Kate and William was born?

No! None of the above, no first page event to be written in every newspaper. **Even though it should!**

But then, **what happened on June 16th 2013?**

It happened that for the first time in history, the Italian **Single National Price of electric energy has reached the quote of ZERO** for two hours.

This means that in those two hours in the whole territory of Italy all the electric energy consumed has been produced from renewable sources. And nothing catastrophic happened, as the detractors of renewables have always claimed: no problems to the electric grid, no blackouts, no unbalance. Nothing of the above happened, to the point that nobody noticed the difference from the previous day.



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Webliography:

www.invitalia.it/site/eng/home/investment-opportunities/renewable-energy-sources.html
www.nortonrosefulbright.com/knowledge/publications/66177/european-renewable-energy-incentive-guide-italy
www.eniscuola.net/en/energia/specials/renewable-energy-in-italy/
www.eniscuola.net/it/energia/curiosit/parco-eolico-italiano-offshore/#title
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