



Green Energy Technologies



The Green Energy Technologies Sector covers technologies, products, equipment and devices. Recent trends underline the principles of a Circular Economy, such as sustainable product design, extending the product lifecycle, reusability, and recycling.

Relevant sub-sectors include:

- Wind
- Solar
- Aero thermal
- Geothermal
- Hydrothermal and ocean energy
- Hydropower
- Biomass
- Landfill gas
- Sewage treatment plant gas and biogases
- Power generation
- Management and control systems
- Energy efficiency and carbon services
- Energy conservation
- Electric vehicles
- Biofuel technologies
- Energy conservation technologies focused on reducing CO2 emissions

- Cogeneration technologies
 - Carbon capture technologies
 - Off-grid clean energy solutions
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EU Focus

The global demand for clean energy, i.e. produced from green energy sources, is set to rise. The global market in low-carbon and energy efficient technologies is projected to nearly triple to US\$ 2.2 trillion by 2020. Since 2003, the quantity of renewable energy produced in the EU-28 grew on average by 6.3% per year, with an overall growth of 88% in 10 years.

Almost 80% of all power capacity installed in the EU in 2014 was renewable.

In 2014, the share of renewable energy sources accounted for 16% of the total gross final energy consumption within the EU-28. The European Union has set this share to be 20% of the gross final consumption in 2020. The highest share of renewable energy in gross final consumption in 2014 was achieved by Sweden (53%), followed by Latvia, Finland and Austria who reported a share higher than 30%.

Wind

Wind accounted for 55.3% of new renewable energy installations in 2014. Wind power generation almost quadrupled over the period 2005-2013. In 2014, wind accounted for 29% of the electricity generated from renewable sources. In terms of annual installations, Germany was the largest market in 2014, followed by the UK, Sweden and France.

Solar

Solar power electricity generation has increased rapidly in recent years and in 2014 accounted for 11% of all renewable electricity. Solar photovoltaic accounted for 37.5% of the new renewable energy installations in 2014.

Aerothermal

The number of heat pump units sold in the European heat pump market increased by 3% in 2013. Using heat pumps in Europe is responsible for 18.8 Mt of greenhouse gas emission savings. Overall, heat pumps are performing well but there is still a tremendous potential.

Geothermal

Geothermal power accounted for an estimated 3.7% of total renewable energy consumption in the EU in 2011.

A growing number of EU countries are developing geothermal projects including Italy, Germany, France and the United Kingdom.

Ocean energy/ Hydrothermal

Oceans represent a huge, predictable resource for renewable energy. The main forms of ocean energy are waves, tides, marine currents, salinity gradient and temperature gradient. Europe continues to be a global leader in wave and tidal technologies, which nonetheless are still in R&D

phase.

Hydropower

Hydropower is the renewable source that produces the highest share of electricity from renewable sources.

EU hydropower potential is already relatively well exploited and expected future growth is rather limited – to between 470 TWh and 610 TWh of total annual generation.

Biomass

Looking at electricity from renewable sources, the share of biomass (wood and other solid ones) grew from 3.5% in 1990 to 9.5% in 2013. Biomass dominates the renewable heating market, where bio heat accounts for 92% of renewable heating and 13.1% of total heat in the EU in 2010. Most is used for domestic heating.

Biogas

The term biogas is used to identify gas that is produced from different types of bio feedstocks via anaerobic digestion. This includes landfill gas, sewage treatment plant gas and others for example gas from decentralized agricultural plants and municipal solid waste. In 2013 the EU-28 produced more than 13,000 ktoe of energy from biogases. Landfill gas is the main single contributor accounting for 22% of the total energy from biogases. The contribution of gas from sewage sludge was almost 10% of the total.

Energy Efficiency and Conservation

Energy efficiency improved by 15% at EU level between 2000 and 2013, resulting in an average annual saving rate of 1.2%. The energy efficiency progress was stronger before the economic crisis: the annual saving rate was 1.3% in the years between 2000 and 2007 and decreased to 1% after 2007. Around 33% of the energy savings come from households, 32% from industry, 27 % from transport and 8% from tertiary.

Biofuel Technologies

Biofuels have been historically the main renewable energy source used in transport, followed by renewable electricity. The highest consumption of biofuels was reached in 2012, when 14.5 Mtoe of biofuel was incorporated. Even though the level of consumption declined in 2013, it picked up again and grew by 6.1% between 2013 and 2014.

Cogeneration (CHP)

The EU currently generates 11.7% of its electricity using cogeneration. However there are wide differences between member states, with varied shares of cogeneration in total electricity production. Slovakia has the greatest share of cogeneration in total electricity generation (78.6%) followed by Denmark (48.8%).

Carbon Capture and Storage (CCS)

According to the EC Energy Roadmap 2050, 18% of electricity will be generated by power plants with CCS by 2050, in the current policy initiatives scenario. In some scenarios, the share could be higher, 19-24 %, or even 32% if nuclear energy is constrained. Zero emission plant technology is ready for the demonstration phase and could be commercialized as of 2020.



Funded by the
European Union

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