European Commission

JRC SCIENCE FOR POLICY BRIEF

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Renewable energy deployment in the European Union[1]

Headlines

- The outlook for renewable energy in the European Union is clear – they will continue to grow as they are now well-established across most of the Member States. The only question is how quickly and with which policy support?
- It is crucial that European Union reaches its 20% target for renewable energy deployment by 2020, and creates a firm basis for future development, especially if a non-binding bottom-up approach is agreed for delivering the 2030 target.

Policy context

Mitigation of climate change has been one of the primary rationales behind the European Union 2020 Climate and Energy Package that through the Renewable Energy Directive sets a legally binding target for the European Union of 20 % of gross final energy consumption from renewable energy by 2020.

The 2030 Climate and Energy Policy Framework that precede the European Union contribution to the Paris agreement, was adopted in October 2014 setting three key targets (i) a binding European Union target of at least 40 % domestic reduction in greenhouse gas emissions by 2030 compared to 1990; (ii) a binding target at European Union level of at least 27 % for the share of renewable energy in 2030; (iii) an indicative target at European Union level to improve energy efficiency by at least 27% in 2030 compared to projections of future energy consumption.

To implement this strategy, on 30 November 2016, the European Commission presented a package of proposed measures calling for, among them, the recast of Renewable Energy Directive and for a strong Energy Union Governance.

The 2030 renewable energy targets are currently under discussion in the European Parliament with a view to making them more robust. A draft proposal presented on 18 May 2017 in the Committee of Industry, Research and Energy, calls for a European Union renewable energy target of 35%, as well as binding individual targets for the Member States.

Key conclusions

Progress towards the 2020 renewable energy targets is on track for the European Union as a whole and for most Member States.

Already in 2015 ten Member States had met and/or exceeded their 2020 targets for overall renewable energy share.

The deployment of biomass (both as bioelectricity and bioheat), solar photovoltaic, wind and heat pumps at aggregated European Union level have met and/or surpassed the planned trajectory.

Almost 30 Mtoe of final renewable energy produced in the European Union, twice the expectations, is actually available to be virtually transferred between the Member States through the mechanism of statistical transfers.

Main findings

The overall renewable energy share in the EU's gross final energy consumption has reached almost 17% in 2015.

[1] This brief is based on the JRC Science for Policy report EUR 28512 EN: "Renewable energy in the European Union - Renewable energy in the EU further to Renewable Energy Directive reporting – Volume 3" (2017), Banja M, Monforti-Ferrario F, Bódis K, Jäger-Waldau A, Taylor N, Dallemand JF, Scarlat N, https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/renewable-energy-deployment-european-union-renewable-energy-european-union-further-renewable

"Clean Energy for All Europeans"

The 'Clean Energy for All Europeans' package is a set of legislative proposals released in November 2016, aimed at further completing the internal market for electricity and implementing the Energy Union. The recast of Renewable Energy Directive complementing the Energy Union governance by creating the conditions across the three sectors (electricity, heating/cooling and transport) to make it easier to meet the EU 2030 target collectively. According to the new proposal the minimum target of 27% share of renewable energy in gross final consumption set for 2030 is binding at the EU level, but is not be translated into nationally binding targets. Nevertheless the proposal provides flexibility for Member States to develop the renewable energy sector that corresponds best to their national situation, preferences and potential, provided they at least collectively reach the 2030 target.

European Union Member States are moving at different speeds in terms of deployment of renewables and most are on track to achieve their targets.

In 2015: Germany remained the main European Union market for renewables, having installed above 84 GW of both wind and solar photovoltaics. This represents more than one fifth of the whole European Union's final renewable electricity installed capacity; Denmark shows how it has shifted substantially away from its traditional energy portfolio, having already integrated high shares of variable renewables: the wind contribution to its gross electricity consumption accounted for almost 40%; Spain has become the second Member State after Ireland to generate more energy from wind than any other renewable source, while Luxembourg was the only Member State to use more renewable energy in the form of biofuels; Italy has seen the fastest increase of solar photovoltaic technology, which in 2015 covered 7% of its electricity needs.

The progress of renewables in heating/cooling sector has been about half that in electricity sector. Nonetheless there have been positive developments in this sector and most of Member States met and/or exceeded their 2020 planned shares, mainly due to the higher than planned use of biomass, the early widespread introduction of heat pumps and a decrease of gross final heat/cold consumption.

The share of renewable energy in electricity sector almost doubled over the period 2005-2015, and its contribution to reducing greenhouse gas emissions increased almost twofold just during the last six years. Indeed in 2015 this sector accounted for nearly two-thirds of total greenhouse gas emissions saved in the EU due to the use of renewable energy.

Electricity from wind and solar photovoltaics has become a key contributor to the transformation of the European Union's electricity system. These two technologies accounted for approximately 18% of the European Union's overall renewable energy in 2015.

The deployment of photovoltaic technology has been as very fast, peaking around year 2011. Although this technology has become now the lower-cost power source in many Member States, the European Union photovoltaic market has been almost stalled in period 2014-2016.

Deployment of wind power systems accounted for the largest share of growth in total European Union electricity capacity in 2015, and 38% accounted for almost one-third of global wind installed capacity in that year.

Even though its development lags behind the expectations, the part of transport sector covered by renewables has become more electric (above 10%) with regard to the fuel composition.

With a contribution of 60%, biomass in three markets (electricity, heating/cooling and transport) remains the main source of renewable energy in the European Union. It will maintain this overall status in 2020 biomass, but in the electricity sector, variable technologies will dominate, together providing more than half of expected final renewable electricity.

Related and future JRC work

The report is part of a series of studies based on European Union Member States obligatory reporting under Renewable Energy Directive. An analysis of the impact of renewables on greenhouse gas emission reduction is also being prepared.

Clean energy is a key to realising Energy Union strategic decarbonisation goals for 2050. The JRC's future work on this topic will incorporate critical analysis of deployment trends, policy drivers and socio-economic aspects.