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# Powerful power markets

5 key policy asks to ensure that market design proposals within the Clean Energy for all Europeans package deliver a sustainable, affordable and secure power system.

## INTRODUCTION

The successful transition to an efficient, renewables based energy system will require the electrification of large parts of key sectors like transport, buildings, and industry. Even if energy savings and efficiency are maximised, this switch will require an increase in electricity demand. It is imperative, therefore, that Europe's power system is completely decarbonised, by ensuring that energy efficiency can compete on equal footing with other resources in line with the "Efficiency First" principle and the use of sustainable renewable energy is supported. EU policy makers have to provide the signals that give all market actors the confidence they need to invest in this change. The European Commission has proposed some positive changes when recasting the Electricity Directive and Regulation. But more can and should be done to integrate energy efficiency, demand side response, and renewable energy into the EU's power system.

The European Commission's proposals have two important and interrelated weaknesses. First, the narrative of the clean energy package seems to cast the increasing use of new technologies as disruptive and problematic. By doing so, the Commission has picked the wrong target. The problems caused by old, inefficient and inflexible power generation infrastructure are what we need to fix, not the positive challenge of more renewables, efficiency, and demand response. Second, the Commission appears to be legislating for the energy system we have today, not the one we will have in the near future, let alone in 2030 – a power system where we use as little power as possible, use that power at the best moment both for the reliability of the system and for our wallets, and use power predominantly generated from the wind and the sun.

The proposals do make some important improvements for individuals and communities who want to produce and consume their own power, but these will only be fully realised if the market as a whole is strengthened for efficiency and renewables. This area of the proposals is not directly addressed in this paper, which focuses on more system-wide elements. Meeting the 5 key policy asks below would move Europe closer to WWF's vision of electricity markets and systems in which low and flexible demand is met by sustainable and variable supply.

## WWF'S 5 KEY POLICY ASKS

The European Commission's proposals for a regulation on the internal market for electricity and for a directive on common rules for the internal market in electricity should be improved in 5 essential ways. WWF calls on the European Parliament and the Council of the EU to make these changes so as to reduce the role of fossil fuels and nuclear in power generation and increase the opportunities for energy efficiency, demand side response, and renewable energy.

1. Sensible smart retirement

*Managed closure of the most polluting and inflexible power stations to end the glut of old, high-carbon, generation capacity on EU power grids*

2. Robust resource adequacy assessments  
*A common methodology to objectively assess whether an electricity system's resources can deliver energy security*
3. Careful capacity markets  
*Markets that, if needed, only support and do not hinder the transition to a clean power system*
4. Markets made for demand response and renewables  
*Ensuring the EU's power system is set up to encourage efficient flexible demand that is met by sustainable variable supply*
5. Guaranteed grid access  
*Retain guaranteed access to the grid and priority dispatch for variable renewables until markets work better*

## KEY FACTS

- Of the 24.5GW of new capacity built across the EU in 2016, 21.1GW – or 86% – was from wind, solar, biomass and hydro, eclipsing the previous high-water mark of 79% in 2014<sup>1</sup>.
- Between April and September in the UK, solar power generated 7,000 gigawatt hours of electricity, while coal only produced 6,300 gigawatt hours. This follows a doubling of solar capacity in the UK in 2015<sup>2</sup>.
- The EU has become increasingly dependent on imports for its fossil fuel use. In 2015 the EU imported 73% of the fossil fuels it used compared with just over half (53%) in 1990<sup>3</sup>.
- More renewables does not threaten grid stability. As Germany went from just over 10% RES in power output in 2006 to almost 30% RES in 2015 the number of minutes of power outages fell from over 21mins to 13mins<sup>4</sup>.
- Capacity shortages where European consumers were actually disconnected due to insufficient power generation have been extremely rare in the past five years<sup>5</sup>.

## 1. SENSIBLE SMART RETIREMENT

The EU as a whole has more electricity generating capacity than it needs<sup>6</sup>. This over-capacity is aggravated by the use of capacity markets that retain power plants in the market

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1 <https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Statistics-2016.pdf>

2 <https://www.carbonbrief.org/analysis-uk-solar-beats-coal-over-half-year>

3 <http://ec.europa.eu/eurostat/documents/2995521/7882431/8-20022017-AP-EN.pdf>

4 <https://www.cleanenergywire.org/factsheets/germanys-electricity-grid-stable-amid-energy-transition>

5 [http://ec.europa.eu/competition/sectors/energy/capacity\\_mechanisms\\_final\\_report\\_en.pdf](http://ec.europa.eu/competition/sectors/energy/capacity_mechanisms_final_report_en.pdf)

that would otherwise have been retired. This situation undermines the investment case for efficiency, demand side response, and renewable energy because there is already more supply than is needed to meet demand. Renewables are now cost competitive with new fossil fuel power plants. However, as new developments that have to repay their financing, renewables cannot compete with old coal plants that have long since recovered the costs of their investment. That is where smart retirement comes in.

Smart retirement is a term coined to describe the need for a strategic approach to address the glut of old, high-carbon, inflexible generation capacity that persists on EU power grids. Such a strategy should accelerate the transition away from an electricity system dominated by fossil fuels and nuclear power plants to one powered by renewables. Whilst the general situation of too much conventional generation capacity continues, there is limited market space for energy efficiency, demand side response, and renewable energy.

Smart retirement of the least flexible and dirtiest power plants (carbon intensive fossil and nuclear) would also make the capacity that really is needed to 'keep the lights on' more profitable by bringing supply more into line with demand. A more **just transition could be delivered using a smart retirement** programme that defines the role that the EU can play in assisting Member States to manage the economic and social costs and benefits of the clean power transition, particularly for low income member states with national industries or companies reliant on high carbon resources.<sup>7</sup>

Smart retirement is not currently in the legislative package. However, while there are as yet no formal legal proposals, the Commission Communication on the *Clean Energy For All Europeans* package provides some encouragement for smart retirement advocates by saying '*Efficiency First* will enable retiring generation over-capacity from the market, especially fossil fuel generation.'<sup>8</sup> A comprehensive programme to ensure the smart and managed retirement of old, high-carbon, inflexible generation, as well as nuclear generation, capacity should be included in the Electricity Directive.

## 2. ROBUST RESOURCE ADEQUACY ASSESSMENTS

The proposed European resource adequacy assessment (Regulation Article 19) is the crucial gateway to Member States being allowed to operate capacity markets, and it should ensure they are only used when absolutely necessary. The proposals go quite a long way to meeting the WWF position on resource adequacy, including by specifying that the European

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6 Ibid

7 [https://www.agora-energiewende.de/fileadmin/Projekte/2015/Smart-Retirement/Agora\\_RAP\\_Smart-Retirement-and-MDI-Background.pdf](https://www.agora-energiewende.de/fileadmin/Projekte/2015/Smart-Retirement/Agora_RAP_Smart-Retirement-and-MDI-Background.pdf)

8 <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52016DCo860&from=EN>

resource adequacy assessment methodology will, inter alia, ensure that assessments are carried out on bidding zone level covering at least all Member States and take into account all resources including existing and future generation, energy demand projections, energy storage, demand response, and import and export possibilities. The European Parliament and the Council of the EU should therefore support the following provisions in the Commission's Electricity Regulation:

1. Capacity markets should only be allowed as a last resort, once a clear need has been established by a transparent EU-wide and regional system adequacy assessment as set out in Regulation Articles 18(1), 19(4) and 23(5).
2. The European resource adequacy assessment shall include an assessment of energy efficiency measures (Regulation Article 19(4)(b)) and take account of the contribution of all resources including energy storage, demand response, and import and export possibilities (Regulation Article 19(4)(c)).

The draft regulation currently calls on the European Network of Transmission System Operators for Electricity (ENTSO-E) to submit a draft methodology for the European resource adequacy assessment to the Agency for the Cooperation of Energy Regulators (ACER) who will then conduct a consultation process involving all relevant stakeholders before either approving or amending the proposal (Regulation Article 22). As well as the national regulatory authorities and other national authorities specified in the text, this consultation process must involve civil society organisations. Because of the complex technical nature of the development of a European resource adequacy assessment, the consultation should also include educative workshops that allow a wide range of stakeholders to participate. ENTSO-E should transparently set out how it developed and decided upon its proposals. Adequate time should also be given to ensure the European resource adequacy assessment is as robust as possible, including the development of robust energy system scenarios. The current 3 months that ACER has to consider the proposals from ENTSO-E seem limited, especially given the tight timeframe in which the proposals will be made. The existing common resource adequacy assessment used by the Petalateral Energy Forum provides a strong example of what could be introduced at European level.<sup>9</sup>

### 3. CAREFUL CAPACITY MARKETS

Capacity Markets may be needed as part of an energy system with increasing levels of variable renewable energy from wind and solar power, but should only be implemented as a last resort. The use of potentially expensive capacity markets can be restricted through the

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9 [https://www.bmwi.de/Redaktion/DE/Downloads/P-R/pentalateral-energy-forum-second-political-declaration.pdf?\\_\\_blob=publicationFile&v=1](https://www.bmwi.de/Redaktion/DE/Downloads/P-R/pentalateral-energy-forum-second-political-declaration.pdf?__blob=publicationFile&v=1)

establishment of better functioning, faster, and more liquid energy and balancing markets. Such markets should reflect the real time value of energy. Markets that work in this way would help to secure the investments needed in options such as demand side response, energy efficiency, effective grid management, interconnections between national grids, and grid level storage options. Nevertheless, some guarantee of available spare capacity might still be needed to ensure that electricity generation will be available if there is insufficient wind and solar energy.

However, this legitimate need for a power system with more and more variable renewables is not an excuse for poorly designed capacity markets that could lead to electricity users paying to keep polluting power plants online long after they should have been switched off. This is particularly absurd at a time when Europe as a whole already has too much conventional/non-renewable power generating capacity. The idea of capacity markets to facilitate high levels of variable renewables must not be perverted to create backdoor subsidies for fossil fuels, which the EU has agreed to phase out through a declaration of the G7 nations in May 2016<sup>10</sup>, or for nuclear power.

In order to ensure that European citizens are only paying for the provision of back up capacity that **supports a clean energy transition**, a number of the elements of the Electricity Regulation should be strengthened.

EU Member States and the European Commission should:

1. Require capacity market design to deliver the flexible services that modern, clean energy systems require by setting a level playing field for all resources on the supply and demand side, to deliver the right mix of:
  - Energy efficiency
  - Demand side response
  - Storage
  - Interconnection
  - Generation (prioritising most flexible / least polluting (see below))
2. Block all, existing and new, fossil fuel power generators from benefiting from capacity payments unless they:
  - emit less than 350 grams of CO<sub>2</sub> per kWh of power produced;
  - comply with the European air quality standards including the Industrial Emissions Directive's best available techniques reference documents (BREFs)
3. Tighten the pollution restrictions set out above over time to ensure only the most efficient, flexible and least polluting non-renewable power generators can benefit.

4. Stipulate that all of these requirements apply to capacity markets, and the demand and supply side technologies seeking to benefit from them, from the entry into force of the regulation.

## MAKING MARKETS FOR DEMAND RESPONSE AND RENEWABLES

The Commission's proposals give clearer market access for renewables and demand side response, making it easier for them to participate, and they should be retained. Overall, in order to integrate increasing shares of variable renewable electricity, the EU's power system needs to become more flexible on both the supply and the demand side. Each Member State should be required by the Electricity Directive to assess and remove all potential barriers to fully integrating flexibility options into the power system, including barriers that block network companies from investing in demand-side alternatives<sup>11</sup>. This should include facilitating the participation of pro-sumers and energy communities in power systems and markets.

Of particular importance to renewables is the proposal (Regulation Article 5(1)) that states *'balancing market rules and products shall respect the need to accommodate increasing shares of variable generation'* and the proposal (Regulation Article 7(4)) that states *'by 1 January 2025, the imbalance settlement period shall be 15 minutes in all control areas.'*

Most important for demand response is Regulation Article 9 which allows for scarcity pricing through which **electricity prices will reflect the real time value of power generation**. Such pricing should be in the form of volumetric time of use prices that reflect not only the balance of supply and demand but also include network costs that reflect the demand being placed on power grids. This is needed to drive demand side response, which is most incentivised when it can be used to avoid very high prices and which, in doing so, reduces the severity of those price spikes. Furthermore, the language in the proposed Electricity Directive is crucial for enabling the development of a robust demand response market. In particular, Articles 13 and 17 set out the role for aggregators in power markets and state that they *'shall not be required to pay compensation to suppliers or generators'* (Dir. Art. 17(2)(d)). The proposals should also require that demand side response and energy efficiency are able to compete on equal footing with generation in capacity markets<sup>12</sup>.

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11 <http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-performancebasedregulationeudsos-2014-may.pdf>

12 <https://www.raponline.org/wp-content/uploads/2017/02/rosenow-cowart-bayer-fabbri-energy-research-social-science-assessing-eu-energy-efficiency-policy-2017.pdf>



## GUARANTEED GRID ACCESS

Power from renewable energy projects currently benefits from priority dispatch into power grids, as ensured by Article 16 of the current Renewable Energy Directive (RED). However, in this package of proposals, this matter of priority access and dispatch is moved from the RED to the Electricity Regulation. Regulation Article 11 removes the right for Member States to grant priority dispatch to new renewables installations with very limited exemptions. This guaranteed access and priority dispatch are important elements of investors' confidence in renewables projects, since they can be sure that the power their investment generates will be used. Removing priority dispatch for renewables without better functioning, faster, and more liquid energy and balancing markets being fully established alongside a programme of sensible smart retirement will result in more emissions from the power sector, due to more coal and gas being dispatched<sup>13</sup>. Priority dispatch should, therefore, be retained for all new and existing variable (those which cannot control when they generate power) renewables installations, at least until Member States can clearly demonstrate that an appropriate market design is in place and implemented.

Priority dispatch also needs to be seen in conjunction with curtailment (the switching off of some power plants when there is more supply than is needed to meet demand). These proposals keep renewables as the energy source most protected from non-market curtailment (Article 12) and this should remain the case. Without this protection, renewables are likely to be curtailed more than other power sources because it is both cheaper and easier to switch off wind and solar than it is coal and gas.

Priority dispatch and curtailment do not only apply to renewables, and it is important that the removal of must-run provisions from all power sources, especially fossil fuel and nuclear generators, is maintained. In case of surplus generation, the renewable energy production should not be switched off, but rather be stored in order to be available when demand picks up, such as through power to gas, pump storage, or grid level batteries when available.

## CONCLUSIONS

While the European Commission has made some steps in the right direction, it only appears to have updated the Electricity Regulation and Directive from its original form to something that better meets the needs of today's power markets. But these laws will not come into force for two years at least, if not more. Europe needs electricity markets designed to meet

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13 [https://www.agora-energiewende.de/fileadmin/Projekte/2016/De-Risking/Agora\\_RAP\\_2016-Assessing\\_the\\_Winter\\_Package\\_in\\_Light\\_of\\_Energy\\_Union\\_objectives\\_FINAL.pdf](https://www.agora-energiewende.de/fileadmin/Projekte/2016/De-Risking/Agora_RAP_2016-Assessing_the_Winter_Package_in_Light_of_Energy_Union_objectives_FINAL.pdf)



the needs we will face in 2025 and 2030. To achieve that, WWF's 5 key recommendations should be adopted by the Council of the European Union and the European Parliament.

## 1. SENSIBLE SMART RETIREMENT

*Managed closure of the most polluting and inflexible power stations to end the glut of old, high-carbon, generation capacity on EU power grids*

## 2. ROBUST RESOURCE ADEQUACY ASSESSMENTS

*A common methodology to objectively assess whether an electricity system's resources can deliver energy security*

## 3. CAREFUL CAPACITY MARKETS

*Markets that, if needed, only support and do not hinder the transition to a clean power system*

## 4. MARKETS MADE FOR DEMAND RESPONSE AND RENEWABLES

*Ensuring the EU's power system is much more flexible on both the supply and the demand side*

## 5. GUARANTEED GRID ACCESS

*Retain guaranteed access and priority dispatch for variable renewables until markets work better*

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