# Assessing the Winter Package in Light of the Energy Union Objectives

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This note seeks to cut through the details and complexities of the legislative and policy initiatives included in the so called "winter package".[1]

Success of the package hinges on whether it delivers on the overarching objectives of the Energy Union project: efficiency first, EU being the world leader on renewable energies, empowering citizens to participate in the energy transition, creating jobs and innovation, and enhancing energy security.

Looking through the prism of these objectives we identify aspects of the winter package that are critically important and others that would seem counterproductive.

Overall, we observe that:

- Today, Markets in Europe **are oversupplied with generating capacity.** Reserve margins over peak-load are 2-3 times what is necessary to meet traditional reliability of supply standards, and even discounting renewable energy capacity to reflect its variability does not alter the basic fact of oversupply (figure 4). Against this backdrop, there is **a very high risk that national capacity payments to conventional generators, justified by "keeping the lights on", will instead be used to keep existing (over-)capacity in the market**[i], creating windfall profits, further fossil-fuel lock-in and stranded assets[ii], putting at risk the GHG reduction targets committed to in Paris and making the EU energy transition more costly[iii]. Capacity payments also drastically reduce incentives for innovative market based solutions that miss their business case due to the capacity receiving subsidies.
- It is therefore critical to **prioritise and phase market design reforms.** Market design reforms must be embedded in and support the EU's medium and long-term decarbonisation strategy.[iv]
- Creating space in the market for renewable energy producers by **enhancing power market flexibility and accelerating the exit of stranded assets is an absolute priority and a "no regret" solution under all circumstances.** This would also unlock business opportunities for new actors on the demand side of the market and allow EU citizens to engage in the transition as prosumers.
- **Planned capacity interventions are likely to become road-blocks to decarbonisation,** unless they come with a **phase-out road map** and Member States have developed **national decarbonisation strategies** consistent with EU climate and energy goals as well as **priority options for enhancing power system flexibility**[v]**.**
- The ETS remains important to set a stable, long-term upper boundary for $CO_2$ emissions from the power system. However, the enormous (and growing) surplus of emission allowances and the inertia imposed by the installed base of high-carbon generation means **the ETS cannot drive the pace or scale of new low-carbon investment in the EU power system throughout the 2020-2030 decade; without further, much more far-reaching reforms** (figure 5).
- Investors therefore look to EU and national regulation on energy efficiency and on renewables to decide whether they will invest or not (figure 2). **Ambitious and binding targets on efficiency and renewable energy, underpinned by a set of credible and robust measures for target delivery, and a reliable framework for monitoring progress are thus the most important element of the winter-package** if the Energy Union objectives are to be met.
- Given the **urgency of charting a pathway out of coal in some Member States,** the political communication around the winter package should furthermore highlight the benefits of the smart and managed retirement of old, high-carbon, inflexible capacity for climate protection and for making power markets function more effectively[vi], and signal EU-support to cope with the socio-economic challenges involved, particularly in regions with mining activities.

[1] To keep the text concise, all sources are provided by way of endnotes.

## Critically important statements and measures at a glance

**Commission Communication introducing the package**

The Communication introducing the winter package should acknowledge that EU markets are oversupplied with capacity. It should recognise that over-capacity and capacity markets drastically reduce incentives for innovative market-based solutions, particularly flexible demand response. It should acknowledge that the EU ETS will not drive needed investments into renewables and efficiency during the 2020-2030 decade. The Commission should announce development of a Commission Action Plan on Efficiency First as well as an EU strategy for the smart and managed retirement of coal-fired generators. It should signal the availability of complementary finance to unlock efficiency improvements, particularly in the building sector and to de-risk investments in renewables. The Commission should announce that it will in future Impact Assessments conduct an "avoiding stranded assets"-analysis, benchmarked against EU energy and climate targets.

**Energy efficiency Directive and Energy Performance of Buildings Directive**

Efficiency First should be established as foundational principle. The efficiency target should become legally binding and be increased to at least 30, better 35 or 40 percent energy efficiency improvement by 2030. The annual savings obligation in Article 7 EED should be extended beyond 2020. Energy suppliers and distributors should be obliged or incentivised to become agents of the transition to a low carbon economy.

**Renewable Energy Directive**

The 2020 national targets should stand even after 2020. The Directive should include a gap-filler, enabling Member States to understand the status of their initial pledges to EU target achievement. Member States should be allowed to put in place revenue stabilisation mechanisms for renewable energy investments. Retroactive changes to support measures given to renewable energy projects should be prohibited. The Directive should include a common rule book for national renewable energy frameworks. The principle of priority dispatch should be confirmed and specific conditions established for its eventual phase-out, protecting existing investments. Citizens and energy cooperatives should be given an enforceable right to produce and consume their own electricity and to participate in tendering procedures for new capacity on fair terms. Consumers should receive information on the $CO_2$ impact of their energy consumed.

**Electricity Market Directive**

Capacity markets should be a measure of last resort. They should not be allowed unless no-regret measures for making markets more flexible and faster have been implemented. They could only be put in place if, despite appropriate energy market measures having been implemented, an EU-wide or regional system adequacy assessment conducted by an independent entity confirms investment needed to meet established resource adequacy standards is not coming forward and if a strategic reserve would be insufficient. All capacity interventions should need to come with a phase-out roadmap and be fully consistent with decarbonisation strategies and priorities for enhancing power system flexibility. To be consistent with climate objectives, *new* coal fired capacity should be prohibited from participating in capacity mechanisms. Citizens and service providers of their choice should be empowered to access their consumption data in real time. It should be excluded that suppliers are recovering from their customers the loss of revenue resulting from demand response. Fixed demand charges should be kept to a minimum – recovering only the fixed costs of assets dedicated to each individual customer – and adopting time-of-use energy and network charging should be accelerated.

**Security of Supply for Electricity Regulation**

The Regulation should set out the conditions for conducting EU wide or Regional System Adequacy Assessments by an independent entity and establish the basis for developing a robust and transparent methodology.

**Planning and Reporting on Climate and Energy Regulation**

Efficiency First should become an overarching element of the National Energy and Climate Plans. National renewable energy and energy efficiency policies should be clear, robust and stable to create confidence with investors. Demand projections used in EU and national modelling should be made consistent with efficiency and climate goals. Member States should assess available power system flexibility options and set out priorities for removing economic, regulatory or administrative barriers to unlocking power system flexibility.

## Efficiency First

**Links to energy union objectives:**

- **Efficiency** – including end-use energy efficiency and demand response – aligns squarely with the **"New Deal" for consumers,** placing citizens at the centre of the energy transition.
- Enhancing energy efficiency **decouples economic growth from carbon emissions.** This is critical to tackling the climate change challenge in a socially and economically sustainable way.
- Efficiency improvements **reduce vulnerability of the EU economy to price fluctuations** in fossil fuels.
- Enhancing energy efficiency (particularly in buildings) **reduces gas demand** and thus (political) **dependency on few external suppliers.**
- Investments into energy efficiency **create lasting value in the EU economy** and reduce the amount of money "burnt" for imports of oil, gas, and coal.[vii]
- Enhanced energy efficiency reduces energy consumption**, allowing for a more rapid retirement of fossil-fired (over-)capacity** and reducing investments needed into clean energy sources.
- Investments into energy efficiency and demand response **create new markets, enable industrial innovation and unlock new business models.**
- Through energy efficiency improvements in their homes and responding to price signals**, citizens can directly contribute to and participate** in the energy transition.

**Critically important**

- Establish **Efficiency First as a foundational policy principle of the Energy Union** and commit to developing a **Commission Action Plan setting out short-, medium-, and long-term actions** needed to implement, monitor, and enforce Efficiency First. [-> political communication, governance regulation, EED, EPBD]
- Set a level of **ambition on enhancing energy efficiency** that demonstrates the principle is taken seriously. This requires a **legally binding EU-target of at least 30, better 35 or 40 percent,** improvement in energy efficiency by 2030 [-> EED].[viii]
- Recognise the **link between an ambitious energy efficiency target and the potential for cost-effective decarbonisation of transport and of heating** through electrification (see Figure 1).[ix] [-> political communication, EED]
- **Extend the annual energy savings obligation in Article 7 Energy Efficiency Directive** beyond 2020, and remove the flexibilities that weaken its impact; strengthen measurement and verification, and ensure periodic review of efficiency policies. [-> EED]
- Push for **robust and stable national energy efficiency policies** that create confidence with investors by making the **energy efficiency first principle a core and overarching element of national energy and climate plans**. Establish that such plans are comprehensively consulted with stakeholders [-> governance regulation].
- Announce in the political communication around the winter package that the Commission will provide **complementary EU-finance to unlock efficiency improvements, particularly in the building sector** [-> EFSI 2.0, implementation of MFF 2014-2020, and MFF proposal for post 2020]
- Make a **business case out of energy efficiency,** supporting the role of **energy suppliers and distributors as agents of the transition to a low carbon economy** and by **de-risking efficiency investments** so that these become economically more attractive. [-> Energy Efficiency Directive].
- Use **consistent demand projections in energy plans and models that assume efficiency targets are met** [-> governance Regulation, Commission modelling for infrastructure planning].
- Include an **"avoiding stranded assets"-analysis benchmarked against EU energy and climate targets as integral part of Commission Impact Assessments** that will be scrutinised by the Commission's Regulatory Scrutiny Board. Such

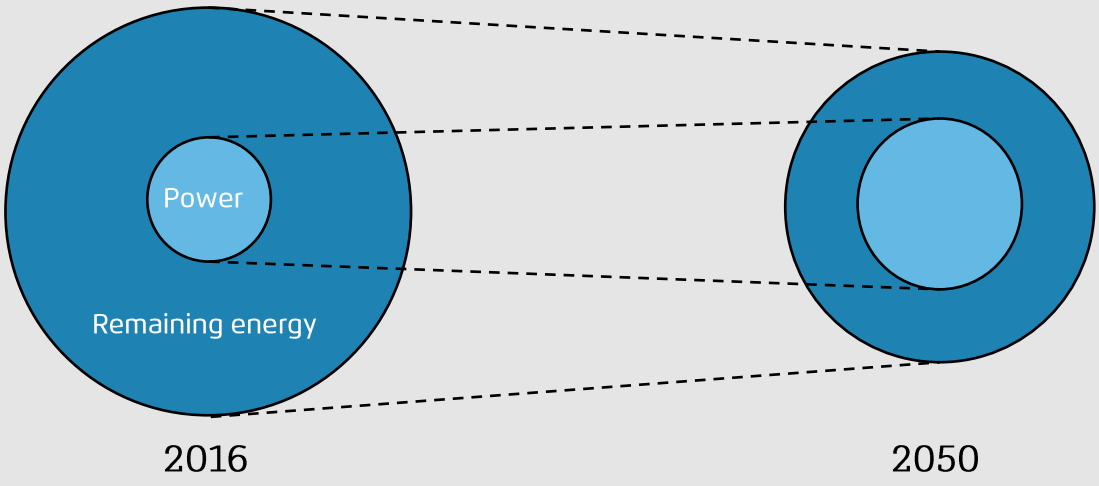
analysis should also include assessing the role of end-use energy efficiency and demand response. [-> Commission internal guidelines on Impact Assessments]

- To support electrification of transport, all **new buildings and buildings that are renovated should be fit with electric vehicle charging points.** [-> EPBD]
- Fixed demand charges should be limited to only those fixed costs associated with assets specific to individual premises and **address network cost recovery through volumetric time-of-use charges.** [-> Electricity Market Directive]

**Pitfalls to avoid**

- Assuming that market signals (plus the ETS price) will be sufficient for driving energy efficiency to the levels required for a rapid decarbonisation of the EU economy, as market signals cannot address persistent market failures such as behavioural biases, uncertainties about future technology values, lack of information etc.
- Ignoring that regulated prices, fixed demand charges, overcapacities in the power sector and capacity markets worsen the business case for energy efficiency services and demand response, constrain consumer engagement and innovation andd undermine the Internal Energy Market.
- Basing infrastructure choices on demand projections obviously inconsistent with EU efficiency goals is creating stranded assets and political "lock-in" of incumbent interests.

Figure 1: To cost-effectively decarbonise, enhancing end-use-energy efficiency needs to go in parallel with increased electrification of the energy system




Typified representation (own illustration).

NB: The leaked Commission Impact Assessment on energy efficiency demonstrates the close relationship between the energy efficiency target and cost-effective decarbonisation through electrification of transport and of heating (see table 8): moving from a 30 percent to a 35 percent energy efficiency target would, for example, allow more than a doubling of electric vehicles (from 15 to 34 million) while reducing the overall capacity of thermal generators and only moderately increasing the amount of renewable generators (656 to 664 GW net installed RES-e capacity).

## EU being the world leader in renewable energies

**Links to energy union objectives:**

- Investments into onshore (increasingly also offshore) wind and solar PV are the cheapest **decarbonisation** options based on levelized cost of electricity[x], and technology costs are projected to fall further.[xi]
- EU companies are world leaders in the **wind industry,** particularly for offshore**. A strong industrial home-base** is a prerequisite for their success in rapidly growing overseas markets and would create more high-value jobs in Europe.
- Renewable energies are central to decarbonising the energy system. Some **EU-regions are leading the world in re-building power-systems to integrate high shares of renewable energies,** and in electrifying transport and heating/ cooling based on renewables. They are **test-beds for an energy system revolution** much beyond manufacturing of solar panels or wind turbines. Indeed, **European companies** develop products, skills and experience in these regions that will provide them with a **competitive edge in global markets of the future.**

**Critically important**

- To clarify that the **2020 RES targets must be fulfilled by all Member States even after 2020.** Furthermore, the 2020 renewable energy targets should constitute the **minimum baseline as regards a Member State's contribution to the 2030 EU RES target.**[xii] [-> revised RES-Directive].
- To **establish up-front the applicable measures in case the collective pledges of Member States to target achievement do not add up** (gap-filler). Unless there is clarity from the start on how specific contributions for filling an eventual gap will be determined (including gap-sharing benchmarks) all Member States will be unclear about the value of their initial pledges. The revised Renewable Energy Directive would thereby discourage ambitious national pledges but not encourage them as it should. **Investors and renewable energy companies would take the absence of a credible gap-filler in the Directive as a clear sign not to prioritise developing renewable energy projects in Europe.** [-> revised RES-Directive].
- To establish that **Member States are allowed to put in place revenue stabilisation mechanisms** for renewable energy investments in the power sector insofar and where competitive tendering of new capacity shows this is needed.[xiii] [-> revised RES-Directive].
- To establish a **binding and enforceable principle ruling out the possibility that national governments retroactively devalue investments made** on the basis of multi-year government commitments to stabilising revenue flows.[xiv] [-> revised RES-Directive]
- To set out a **"common rule-book" for national renewable energy frameworks** and a **roadmap and process for driving the progressive convergence** of national frameworks.[xv] [-> revised RES-Directive].
- **Priority dispatch for renewable energy producers is confirmed as a principle.** Removal of priority dispatch for renewable energies is possible, but made contingent on Member States demonstrating that an appropriate market design is in place and implemented.[xvi] [-> revised RES-Directive or Electricity Market Directive].
- To push for **robust and stable national plans on renewable energy** that create **confidence with investors by setting out technology-specific pathways for the power, transport, and heating & cooling sectors.** Establish that such plans are comprehensively consulted with stakeholders [-> governance regulation].
- The EU power system needs to become more flexible on the supply and the demand side, to cost-effectively integrate the projected 50 per-cent share of renewable electricity by 2030.[xvii]

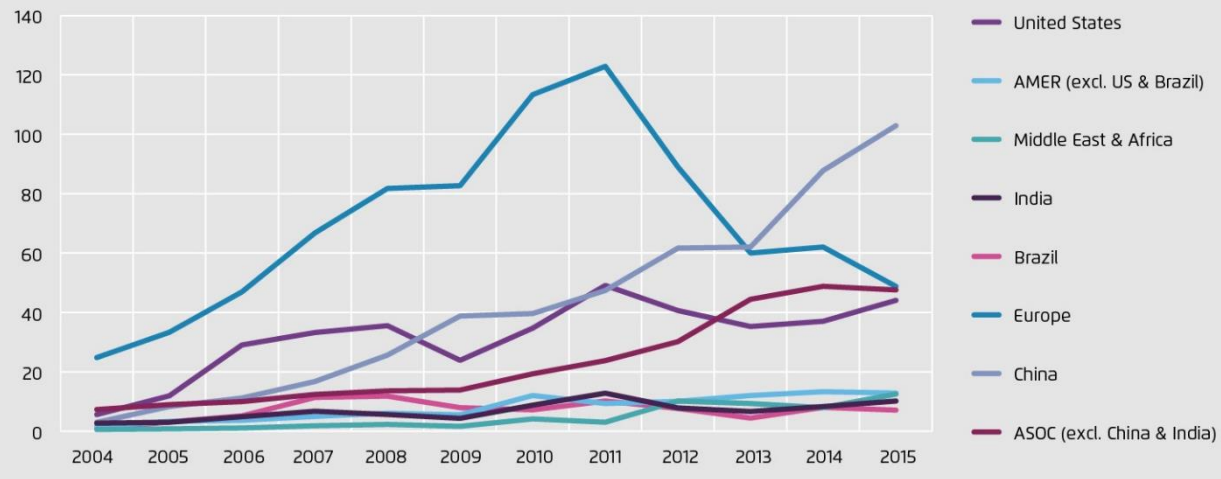
Each Member State should be obliged to **assess regulatory, administrative or economic barriers to existing flexibility options**, in consultation with stakeholders. **Action plans for enhancing power system flexibility** should complement the national climate and energy plans. [-> Governance Regulation, revised Electricity Market Directive].

- Investments into renewable energies are highly capital intensive. **Cost of capital have a major impact on overall project cost and differ widely between Member States**; with cheaper capital in the North and West of Europe and higher capital costs in the South and South-East.[xviii] A focussed **de-risking intervention could make investments into renewables cheaper than investments into new coal or new gas throughout Europe and help achieve renewable energy targets at significantly lower cost.**[xix] [-> revised RES-Directive, EFSI 2.0, MFF 2014-2020, MFF post 2020]

**Pitfalls to avoid**

- To assume the price of ETS allowances will incentivise investments into renewables in the 2020-2030 decade and the closure of cheap fossil-fired capacity (lignite and hard coal).[xx]
- Removing priority dispatch for renewables without better functioning, faster and more liquid markets being fully established and inflexible conventional capacities have been removed. Otherwise greenhouse gas emissions from the power sector will increase, due to more gas and coal being dispatched.[xxi]

Figure 2: Investments into renewables decline in Europe, while going up in all other regions, reflecting uncertainty about RES policies at EU and Member State levels




Source: FS UNEP 2016 based on data from Bloomberg New Energy Finance

## Empowering citizens to participate in the energy transition

**Links to energy union objectives:**

- **Climate change** is a global challenge that ultimately rests on local choices. Empowering citizens in the energy transition allows them to take responsibility and directly contribute to halting climate change.
- The energy transition will result in a **more decentralised energy system** (figure 3). Empowering citizens allows them to directly engage and help advance the energy transition, enhancing its legitimacy and political support.
- **Energy efficiency,** particularly in buildings and in transport, rests on individual choices of citizens as owners and consumers. Empowering citizens allows them to make efficiency first a reality in their home and their behaviour.
- **Renewable energy capacities,** in particular solar PV and onshore wind, are often owned by citizens or citizens collaborating in energy cooperatives. Empowering citizens will allow them to own a share in the energy system of the future.
- **Demand side response** is critical for enhancing energy system flexibility and for a cost-effective energy transition. Unlocking the potential for demand-side response is not possible without empowering citizens to participate in the energy transition and their active consent to become "prosumers".

**Critically important**

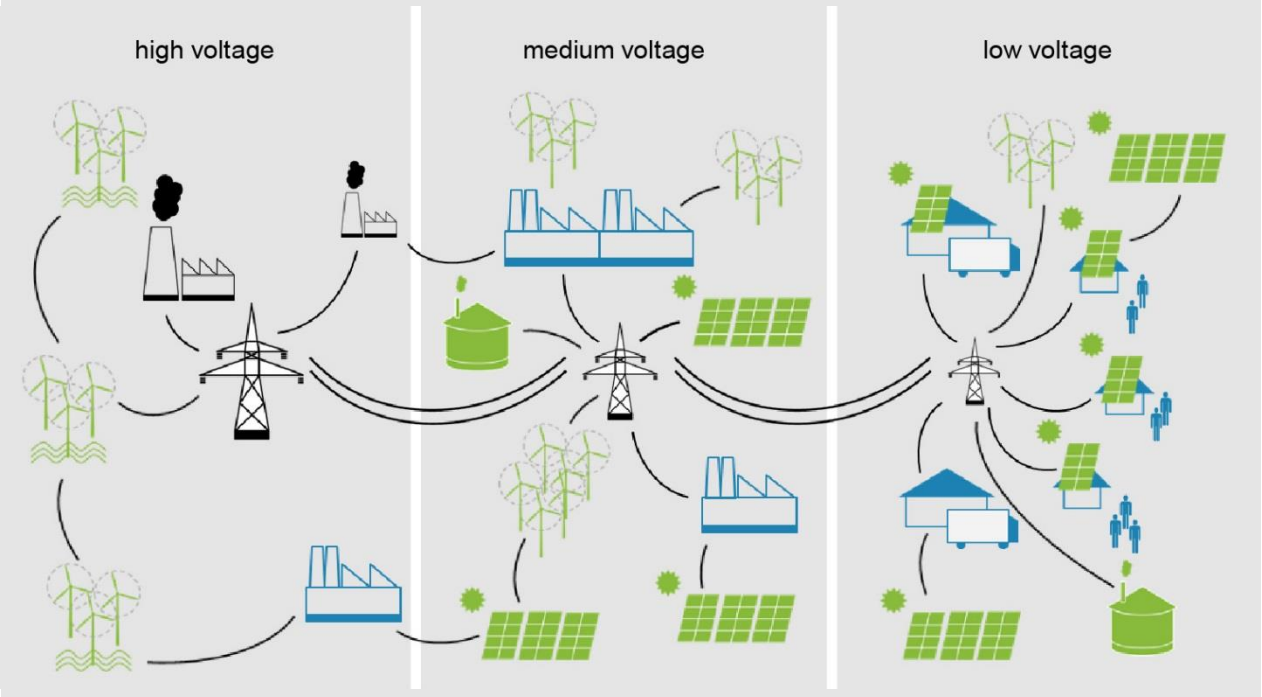
- Oblige Member States to provide for **transparency about tariffs, taxes and charges** that affect end consumer prices. [-> Electricity Market Design]
- By managing electricity consumption in response to price signals, customers can, either directly or through a third party (a demand aggregator), participate in the power market, access new and improved energy services, and benefit from lower costs. All **consumers should be given the right to choose market-related dynamic electricity pricing, including volumetric time-of-use network charges**, and retailers should be settled accordingly. [-> Electricity Market Directive]
- Consumers and the service providers of their choice should be able to **access their consumption data in real time** in order to obtain direct feedback on their consumption and to enable innovative service offers. [-> Electricity Market Design]
- **Demand Response Aggregators and other energy service providers** should be able to access the market and work with the consumer without requiring prior agreement from the consumer's retailer [-> Electricity Market Directive].
- The revised Renewable Energy Directive should establish **basic principles of citizen participation** that include the **enforceable right for citizens and energy cooperatives to produce and consume one's own electricity**, as well as the **right of access to the grid** to sell surplus electricity under fair conditions. [-> revised RES-Directive]
- The revised Renewable Energy Directive should ensure that **citizens and energy cooperatives can participate in tendering procedures** for new renewable energy capacity on fair terms [-> revised RES-Directive]
- EU legislation should **ensure that consumers receive information on the $CO_2$ impact of their energy consumed**. The current system of guarantees of origin does not provide a sufficient link to the energy actually delivered. [-> revised RES-Directive, Electricity Market Directive]

**Pitfalls to avoid**

- If citizens decide to engage in demand side response measures, EU law should not allow that consumers pay their suppliers for the energy they do not wish to consume. Rather, alternative

ways should be identified to allow suppliers to recover legitimate, prudently incurred costs.[xxii]

Figure 3: Typical features of an energy system characterised by flexibility, decentralized structures and a wide variety of actors




Agora Energiewende 2016 (own illustration)

## Market Design in the Energy Transition

**Links to energy union objectives:**

- The electricity market could become a powerful driver for **decarbonising the EU energy system** and help meet climate and energy targets at lowest possible cost.
- With an appropriately high price put on carbon emissions, power market rules would help determine whether market participants are **"internalising" the external costs of climate change**.
- Power market rules (particularly short-term markets) are critical for **enhancing power system flexibility** and for **an energy system transition at lowest possible cost**.
- Building more flexibility into power market operations through appropriate market design helps to **absorb increasing shares of power from (often variable) renewable energy sources** and for **unlocking business opportunities on the demand side and for storage**.

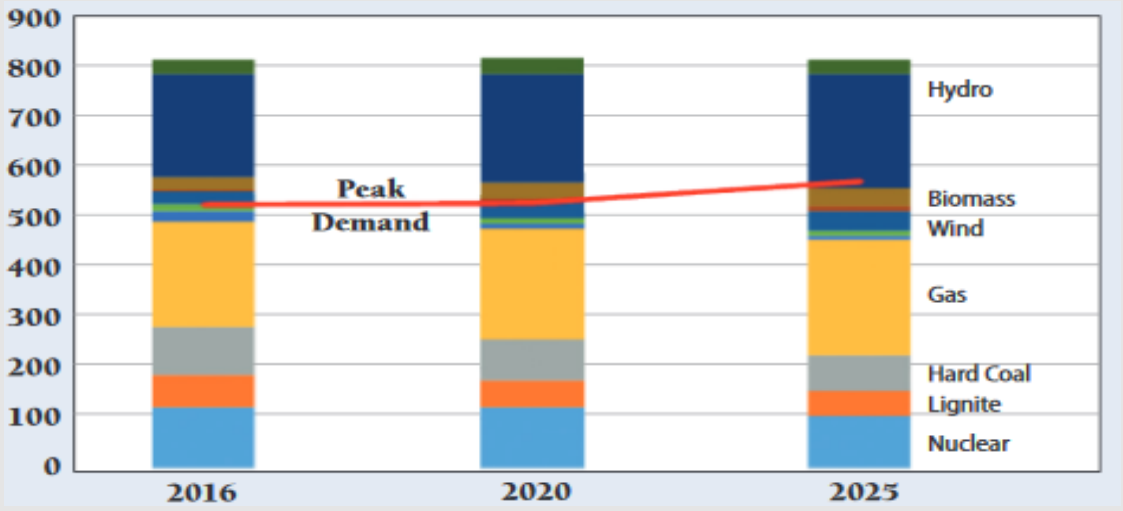
**Critically important**

- To recognise throughout the package that markets in Europe are **oversupplied with generating capacity** (figure 4). [-> political communication, Electricity Market Design Directive]
- There is a very high risk that **national capacity payments to conventional generators**, justified by "keeping the lights on", will be **used to keep existing (over-)capacity in the market**, creating windfall profits, further fossil-fuel lock-in and stranded assets, and retard new investment in zero-carbon and flexible system resources. [-> Electricity Market Directive]
- **Capacity payments also drastically reduce incentives for innovative market based solutions** that miss their business case due to to diversion of market revenues and to legacy capacity receiving subsidies. [-> political communication]
- Given the important role of markets in the transition, the **prioritising** and **phasing of market design reforms** becomes critical: **Market design reforms must be embedded in and support the EU's medium and long-term decarbonisation strategy**. [-> political communication, Electricity Market Directive, Planning and Reporting on Climate and Energy Regulation]
- Planned **capacity interventions are likely to become road-blocks to decarbonisation**, unless they come with a clear **phase-out roadmap** and are consistent with **national decarbonisation strategies** and **priority options for enhancing power system flexibility**[xxiii].
- **Enhancing power market flexibility** and **accelerating the exit of stranded assets** is an absolute priority and a **"no regret" solution under all circumstances**. [-> political communication, Electricity Market Directive]
- **Removal of priority dispatch** for renewable energies should made contingent on Member States demonstrating that an appropriate market design is in place and implemented, otherwise power sector emissions will increase and support to renewable generators will become more costly [-> Renewable Energy Directive, Electricity Market Directive]
- The **EU Emissions Trading System** sets a stable, long-term upper boundary for $CO_2$ emissions from the power system. However, the enormous (and growing) surplus of emission allowances and the inertia imposed by the installed base of high-carbon generation means **the ETS cannot drive the pace or scale of new low-carbon investment in the EU power system throughout the 2020-2030 decade** without more far-reaching reforms (figure 5). [-> political communication]
- To **support Member States that decide to actively remove inflexible, fossil-fired baseload capacity from the system** as this reduces greenhouse gas emissions, enhances power system flexibility, makes market design reforms more effective and reduces overall costs for new renewable energy capacity.[xxiv] [-> political communication.]

**Pitfalls to avoid**

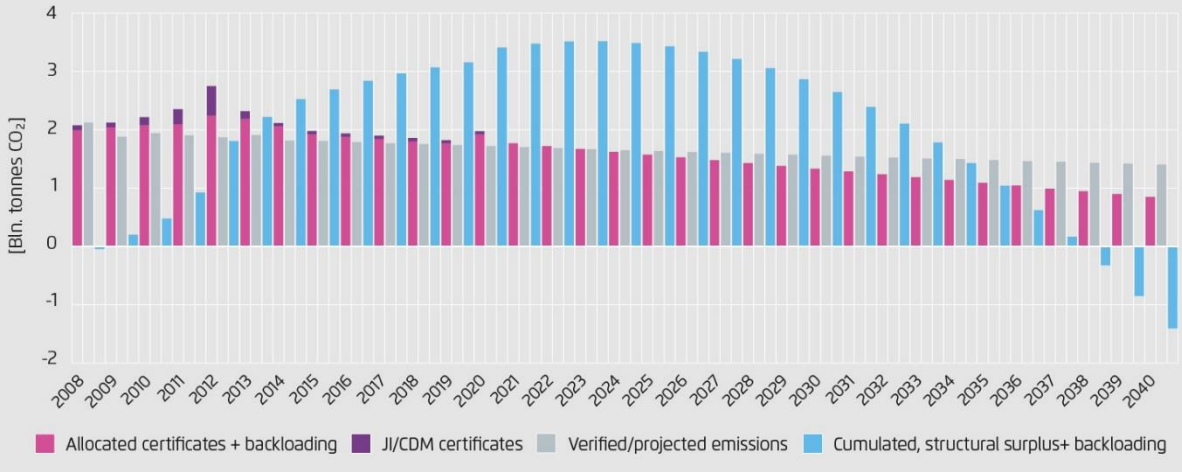
- To allow for national capacity payments to conventional generators, unless they are clearly a measure of last resort. They should not be allowed unless no-regret measures for making markets more flexible and faster have been implemented. They could only be put in place if, despite appropriate energy market measures having been implemented, an EU-wide or regional system adequacy assessment conducted by an independent entity confirms investment needed to meet established resource adequacy standards is not coming forward and if a strategic reserve would be insufficient. All capacity interventions should need to come with a phase-out roadmap and be fully consistent with medium and long-term decarbonisation strategies and national flexibility roadmaps. To be consistent with climate objectives, **coal fired capacity should be prohibited from participating in capacity mechanisms**.

Figure 4: Generating capacity in the EU with zero credit for solar and 20% credit for wind.




Source: RAP 2016 based on ENTSO-e SOAF 2016. Reserve margins over peak-load are 2-3 times what is necessary to meet traditional reliability of supply standards. Even discounting renewable energy capacity to reflect its variability does not alter the basic fact of oversupply.

Figure 5: Cumulated excess certificates in the EU Emissions Trading System 2008-2040




Source: Agora 2016 (own calculation) based on an increased reduction factor to 2.2% p.a. from 2021 and projected emission reductions due to RES / Efficiency of 1% p.a. from 2015, which is a conservative assumption, given politically set targets

[i] The Commission's leaked Impact Assessment on the Market Design Initiative (leak mid October 2016) makes exactly this point. It notes in relation to Table 16 on overall system effects of capacity mechanisms: "CMs seem to be keeping old capacity from retiring on a national level."

[ii] The risks of carbon lock-in in the European power sector are described and analysed in detail in a recent study by the European Environment Agency (2016), Transforming the EU power sector: avoiding a carbon lock-in. EEA Report No. 22 / 2016.

[iii] The need to retire old, high-carbon assets as a prerequisite for a cost-effective, market-based decarbonisation of power systems is well documented in IEA (2014): The Power of Transformation: Wind, Sun and the Economics of Flexible Power Systems.

[iv] For such broader approach see Agora Energiewende (2016), The Power Market Pentagon: A Pragmatic Power Market Design for Europe's Energy Transition.

[v] See Ecofys (2015), Power System Flexibility Strategic Roadmap.

[vi] M. Buck, M. Hogan, C. Redl, The Market Design Initiative and Path Dependency: Smart retirement of old, high-carbon, inflexible capacity as a prerequisite for successful market design. Agora Energiewende /RAP November 2015.

[vii] For avoided system costs for the German power sector, see Agora Energiewende (2014):Benefits of Energy Efficiency on the German Power Sector. Final report of a study conducted by Prognos AG and IAEW, on behalf of Agora Energiewende, European Climate Foundation, Regulatory Assistance Project. The Agora/ECF/RAP-study is the first of its kind to determine the value of energy savings, and the effects of avoided system costs by efficiency investments on the German power sector. Higher efficiency will reduce the costs of the total electricity system by up to 28 billion euros by 2050. Every kilowatt hour not consumed saves between 11 and 15 €cents on the German power sector.

[viii] Note: the European Parliament, business, and civil society groups have repeatedly called for a 40 percent energy efficiency target.

[ix] This point is well developed in the leaked Commission Impact Assessment on energy efficiency (leak September 2016, in particular pp. 42 ff.) and confirms findings from other studies in the field such as Fraunhofer IWES (2015): Wie hoch ist der Stromverbrauch in der Energiewende? Energiepolitische Zielszenarien 2050 – Rückwirkungen auf den Ausbaubedarf von Windenergie und Photovoltaik. Studie im Auftrag von Agora Energiewende.

[x] Range of levelized cost of electricity (LCOE) based on varying utilization, $CO_2$-price and investment cost. Source: Agora Energiewende (2015), IRENA (2015), BNetzA (2016).

[xi] Fraunhofer ISE (2015): Current and Future Cost of Photovoltaics. Long-term Scenarios for Market Development, System Prices and LCOE of Utility-Scale PV Systems. Study on behalf of Agora Energiewende.

[xii] During the 2020-2030 decade a significant share of the installed RES-e capacity reaches the end of its lifetime and will have to be replaced. See A. Held, M. Ragwith et alii, Implementing the EU 2030 Climate and Energy Framework – a closer look at renewables and opportunities for an Energy Union. Towards 2030 Dialogue, Issues Paper 2 of 8 December 2014, p.3.

[xiii] There are a number of factors external to the power market that cannot be controlled by market participants and that have a profound impact on potential revenues of renewable energy projects. This includes: projected ETS certificate prices; the evolution of prices for oil, coal and gas; the quantity and quality of the incumbent power mix; speed of effective implementation of market design reforms; potential cannibalisation effects amongst market revenues available to RES producers at high RES-e market shares.

[xiv] This would reduce investment risk, thereby lower risk premiums on the capital required for investments into renewables and make renewable energy projects significantly cheaper. Currently differences in cost of capital for renewable energy investments mean, for example, that wind power costs about twice as much in Croatia and Greece as it does in Germany despite the same meteorological and technical conditions. See Dia-Core (2016), The impact of risks in renewable energy investments and the role of smart policies.

[xv] Important aspects to address are, for instance, basic features of competitive auctioning systems, scope for technology-specific measures to aid the siting of new renewables capacity, or rules on cross-border participation in renewable support schemes.

[xvi] For this, at minimum the following conditions must be met: (i) no priority dispatch for any other technology, (ii) liquid intra-day markets with gate closure near real time, (iii) balancing markets that allow for the competitive participation of renewable energy producers, (iv) curtailment rules and congestion management transparent to all market parties, (v) RES last to be curtailed, (vi) curtailment compensation related to forgone revenue is in place and (vii) claims for compensation are settled close in time to the event of curtailment.

[xvii] The 2030 renewable energy target implies a share of approximately 50 percent renewable electricity by 2030, about 30 percent of EU electricity will be from wind and solar PV (see Commission Impact Assessment on a policy framework for climate and energy in the period from 2020-2030 (COM SWD (2014) 15 final of 22.1.2014) for scenarios in line with a 40 percent domestic reduction of greenhouse gas emissions).

[xviii] See Dia-Core (2016), The impact of risks in renewable energy investments and the role of smart policies.

[xix] See I. Temperton (2016), Reducing the cost of financing renewables in Europe. Study on behalf of Agora Energiewende

[xx] The leaked Commission Impact Assessment on the Market Design Initiative (leak mid-October 2016) shows the Commission modellers used a CO2 price between 38.5 to 60 Euros per tonne of carbon to test sensitivities of generators to changes in power market rules (Graph 7, Footnote 247, Footnote 253). This is far above the price-range expected by carbon analysts for the 2020-2030 decade and thus very heavily biased in favour of conventional generators and against renewable energies. A fuel switch from coal to gas would require a stable $CO_2$ price of at least 30 Euros per tonne of CO2. Which is not expected before the end of the 2020-2030 decade. To incentivise investments into renewable energies, a stable carbon price of at least 60 Euros per tonne of $CO_2$ is needed.

[xxi] See Table 10, second row in the leaked Commission Impact Assessment on the Market Design Initiative (leak mid-October 2016).

[xxii] P. Baker, Benefiting Customers While Compensating Suppliers: Getting Supplier Compensation Right, RAP October 2016.

[xxiii] See Ecofys (2015), Power System Flexibility Strategic Roadmap.

[xxiv] Elements of such strategy are listed in element 3 of the Power Market Pentagon study (pp. 39-40) of Agora Energiewende. See Agora Energiewende (2016), the Power Market Pentagon. A Pragmatic Power Market Design for Europe's Energy Transition.