

GREEN PAPER: "A 2030 framework for climate and energy policies" - Public Consultation Response

QUESTIONS

4.1. General

Which lessons from the 2020 framework and the present state of the EU energy system are most important when designing policies for 2030?

- The ambitious macro-level targets in the 2020 framework are steering EU energy policy towards attaining sustainability, competitiveness and security of supply. However, in order to achieve these targets and policy goals, the 2020 framework and present state of the EU energy system have demonstrated the importance of incentivizing the appropriate infrastructure development also.
- The EU decarbonisation and renewables agenda are radically changing the energy mix leading to greater levels of intermittent generation. Wärtsilä is pleased to note that in the Green Paper the Commission is highlighting the serious consequence of intermittent power generation that is resulting from the 2020 framework. The 2020 targets focused mainly on renewables and decarbonisation without analyzing in detail the impact of renewables deployment on the remaining electricity generating fleet or the electricity markets. Nowadays, the general consensus is that the large scale deployment of renewables has changed both the energy system and the energy market environment and that this change is permanent. By applying a more holistic view on the energy system and markets, the EU can make an important next step in achieving a sustainable, but also reliable and affordable system.
- EU should define the Power System Architecture for 2030 and beyond including the vision of desired generation capacity mix (market will make investment decisions), geographic locations of loads vs. generation assets, balancing solutions, grid infrastructure, market structures and system operations philosophy. By defining the desired targets in a more concrete, transparent and EU-wide manner, it is possible to develop policy mechanisms which provide long term predictability for all stakeholders in the market. Currently the lack of long term "visibility" is the main concern of current and future market participants such as utilities and new investors in Europe. This issue could be fixed by setting more concrete targets and measures, supported by profound impact assessments.

4.2. Targets

Which targets for 2030 would be most effective in driving the objectives of climate and energy policy? At what level should they apply (EU, Member States, or sectoral), and to

what extent should they be legally binding?

- Regardless of which target(s) is chosen and whether it is legally binding, it is clear that the EU will continue to strive towards GHG reductions by increasing the amounts of renewable and increasing levels of efficiency. The consequence of these actions is that the rest of the power system has to be adapted to support the maximum utilisation of renewables capacity. Therefore, Wärtsilä is calling for a more holistic approach in target setting, which takes into account and interlinks the decarbonisation targets with reliability and affordability targets.
- It is essential that consumers support the decarbonisation agenda, as it will eventually lead to lower energy bills. However, the renewables deployment so far has led to a situation where consumers face increasing energy bills due to increasing subsidies level, CO₂ emissions are not decreasing in Europe and the existing thermal generation fleet is not used efficiently and even mothballed in some cases leading to security of supply issues. This is an unwanted outcome of the EU's existing energy policy. We believe a holistic system level approach can be useful in dealing with these issues.
- The 2030 targets should focus on developing the overall power system where renewables play a significant role. By focusing first on the Power System Architecture, the necessary gaps and development areas can be identified. This will help the EU to focus the policy development more efficiently.
- Another 2030 target element, which is not explicitly included in 2020 targets, is the development of energy markets and reliance on a market based approach. The currently fragmented energy markets in Europe prevent the creation of the Internal Energy Market. Wärtsilä therefore recommends that the EU sets legally binding targets at a European framework level and leaves the implementation to member states. This framework needs to define at least the EU-wide philosophy on energy markets and system operation principles. We believe that important steps are being taken in this direction in form of several network codes. However, the EU should ensure that the objectives of this development really aim for an optimal power system and not for a compromise solution.

Have there been inconsistencies in the current 2020 targets and if so how can the coherence of potential 2030 targets be better ensured?

- As stated before, the 2020 targets focused heavily on sustainability, and e.g. the challenge of renewables integration was not recognised or assessed profoundly. Nowadays, European utilities are facing lower profits from the market, which has led to the investment hiatus and even early closures of existing units. The EU should set energy policy targets that lead to a competitive power system, which in addition to being sustainable is also reliable and affordable. To ensure the coherence of 2030 targets it is important that the EU takes a more holistic view on energy policy development, as decisions e.g. in renewables deployment have an impact on the overall power system and electricity markets. The inconsistencies can be avoided by developing the energy policy based on a system level approach, not by setting individual targets for each “corner” of the future power system.

Are targets for sub-sectors such as transport, agriculture, industry appropriate and, if so, which ones? For example, is a renewables target necessary for transport, given the targets for CO2 reductions for passenger cars and light commercial vehicles?

NO REPLY

How can targets reflect better the economic viability and the changing degree of maturity of technologies in the 2030 framework?

- It is important to avoid defining targets on the basis of technologies, since it cannot be predicted which new technologies will be available and commercially viable in the future. The EU should recognise that by subsidizing some specific technologies, other forms of generation might suffer. This needs to be taken into account when setting the targets. Therefore technologies that “compete” in the same category (e.g. different sources of flexibility: Demand response, storage, interconnectors, and flexible power generation), should be treated on an equal basis.
- Wäertsilä recommends a market based approach as the basis for technology selection in the 2030 framework.
 - Firstly, the policy targets should be set in line with the desired Power System Architecture which defines what type of capacity is required to meet the targets.
 - Secondly, the regulatory framework should ensure a level playing field for all technologies, so that different technologies can compete in the market on an equal basis.
 - Thirdly, all market players and technologies should be fully integrated into the electricity markets and the same market rules should apply for all players (e.g. wind and solar generation must be responsible for balancing).

How should progress be assessed for other aspects of EU energy policy, such as security of supply, which may not be captured by the headline targets?

- The 2030 framework for climate and energy policies should take into account other elements of the energy system design such as security of supply and cost to consumers. Climate policies should not be treated as an isolated element of the overall energy policy. Europe has witnessed the integration issues of renewables as an outcome of the 2020 framework, which lead to potential future security of supply issues. We must learn from these design failures and use this know-how and understanding when putting together the 2030 framework.
- Wäertsilä is calling for a system level approach for the 2030 framework, which includes also security of supply and affordability aspects. Without the system level approach the decarbonisation targets will potentially lead to unnecessary costs to consumers and lower system reliability.
 - For example, in a UK case study measuring the value of flexibility, the introduction of 4.8 GW of flexible generation provided annual savings to the UK

consumers up to GBP 545 million in 2020 (5% of total system costs) and GBP 1537 million in 2030 (19% of total system costs).

- Renewables are not fully integrated into the electricity markets nowadays, and this has led to increased risk of capacity shortfalls due to early closures of power plants. The renewables deployment has changed the energy market environment already and this development will be accelerated when more renewables are added to the power system. If the renewables were integrated into the market and full trust was placed on a market-based approach, the security of supply issues could be addressed through markets. However, this requires that electricity markets are developed to meet the requirements of the changed market environment, and capabilities like flexibility are rewarded transparently through markets.
- Wartsilä recommends that the EU recognises all aspects of power system design in the 2030 framework and the 2030 targets focus on the overall power system optimisation. This includes measures and monitoring of
 - security of supply (long term adequacy and short term system operations) and
 - overall cost to consumers together with
 - renewables and decarbonisation targets.

To implement efficient monitoring, the EU needs to set targets and benchmark levels for all corners (sustainability, reliability and affordability) of the targeted power system.

4.3. Instruments

Are changes necessary to other policy instruments and how they interact with one another, including between the EU and national levels?

- Coherency between policy instruments – both on EU and national levels – should be ensured when they interact with one another, and altogether they should target for an optimal European Power System architecture.
- Wartsilä sees that there is an urgent need for EU level instruments that reward capabilities which are required to integrate the increasing amounts of intermittent renewables efficiently into the power systems. Wartsilä would like the Commission to recognize the need for a market based remuneration mechanism for promoting investments into new capacity that has the required capabilities, and hence suggests that new policy instruments should be developed – and existing ones brought in line – to incentivize its creation.
- Wartsilä supports the EU's market based approach in energy policy and the establishment of the internal energy market for Europe. Firstly, the EU should state the targets for electricity market development. Secondly, the EU needs to identify the gaps between the set targets and the existing market mechanism in the member states, and provide clear legally binding recommendations to develop individual markets towards the Single European Electricity Markets. This work is already ongoing in form of several network codes, but the EU should ensure that the objectives of this development really aim for an

optimal power system and not for a compromise solution. Thirdly, the EU should monitor the implementation of the market-based approach in each member state to ensure that actions are carried out according to the set schedule.

- EU level target setting and implementation guidelines are needed if the EU is targeting for an optimal European Power System Architecture. We have witnessed with the 2020 targets that EU level climate policies are leading to market fragmentation, since member states each solve security of supply issues individually and refer to the implementation of mechanisms at a national level. If a well functioning Internal Energy Market is an objective, then there must be tools to guide electricity market development from the EU level e.g. by setting common rules at the EU level.

How should specific measures at the EU and national level best be defined to optimise cost-efficiency of meeting climate and energy objectives?

- The EU needs a vision for the future Power System Architecture which defines the following aspects of power system design and operation:
 - Generation capacity mix
 - Geographic locations of loads and generation assets vs. load and grid
 - Optimised grid structure
 - Balancing solutions
 - Energy and dynamic balancing market structures
 - System operation philosophy.
- By setting targets and objectives for the optimal Power System Architecture and by defining the gaps between the targets and status quo, the EU could design specific implementation guidelines and measures at the EU and national level. Without clear target setting and a clear vision it is also difficult to define specific measures.
- Another important aspect is related to the electricity market development and the implementation of the market based approach. Currently, several market distortions such as lack of transparency, and out-of-market actions were designed and accepted in the achievement of ambitious climate change targets. It is hard to believe that in the long term these distortions will lead to the least cost power system for Europe. For example, TSO are procuring more reserve capacity due to the increasing amount of balancing actions required. Such reserves are procured under long-term (bi-lateral) contracts and instead of more efficient market based procurement, costs are socialized amongst consumers. Several examples exist of more market oriented electricity markets, e.g. Australia's National Electricity Market, and the EU should learn from these instead of relying on the out-of-date assumptions regarding efficient system operations.
- We must accept that the market environment has changed due to renewables deployment and the old way of thinking will lead to a suboptimal outcome. The renewables integration requires new capabilities, such as flexibility, which provide significant system level savings in system with high renewables penetration.
 - For example, in a study analysing the value of flexibility in California, the introduction of 5.5 GW of flexible generation resulted in annual cost savings of USD 890 million (11% of system costs)

http://www.smartpowergeneration.com/spg/files/library/Smart_Power_Generation_Benefits_final_rev_2-14.pdf

- For example, in a UK case study measuring the value of flexibility, the introduction of 4.8 GW of flexible generation was shown to amount to GBP 545 million in annual costs savings in 2020 (5% of system costs) and GBP 1537 million in 2030 (19% of system costs). These cost savings to consumers are not visible without a system level approach. http://www.smartpowergeneration.com/spg/files/library/Flexible-energy-for-integration-of-renewables_Wartsila_2013.pdf

How can fragmentation of the internal energy market best be avoided particularly in relation to the need to encourage and mobilise investment?

- Basically Europe has two high level options in developing an internal energy market: a) market based approach or b) increased central decision-making. Both options could work, but the risk to consumers is definitely higher with the latter option. As the EU has stated in several policy documents, it believes in the market-based approach and has committed to developing the energy market on this basis. Wärtsilä supports this approach, but currently there is an evident risk of market fragmentation instead of market integration. Wärtsilä recommends following actions to prevent market fragmentation and to encourage and mobilise investments:
 - Understand that the electricity market environment has permanently changed due to renewables deployment and the existing assets might not provide the optimal power system – investments in new capabilities are needed.
 - Set clear targets for the internal energy market and communicate clearly the key elements of the market design. Propose a clear vision for European Power System Architecture and a market mechanism to reward the right capabilities.
 - Identify gaps and market distortions in the member states' existing market structures, and give clear instructions to improve market functioning.
 - Monitor the implementation of the market based approach in member states and publish a progress report and “state of the market” annually.
 - Ensure flexibility for further market development, but prevent market distortions at member state or EU level.
- The EU is pushing for a market based approach, but simultaneously several member states (e.g. Germany and UK) are looking for possibilities to implement some sort of capacity mechanism. There is nothing wrong with capacity mechanisms as such, if they are designed correctly and do not distort the price signals in the market. Utilities are calling for long-term investment certainty, and the market design should provide this certainty. If out-of-market mechanisms are implemented at member state level, the EU should ensure that these mechanisms do not distort the market or artificially prolong the lifetime of the existing capacity, which is no longer optimal for the future power system. Without clear targets and instructions from the EU level, the fragmentation of the internal energy market will continue, and there will be no market-based investments in new capacity.

Which measures could be envisaged to make further energy savings most cost- effectively?

- Efficient renewables integration provides huge energy saving potential at the EU level. Currently renewables balancing is handled mainly with the existing thermal units, which were not designed for balancing purposes. Several recent studies indicate that more flexible generation could handle the balancing task more efficiently, without unnecessary inefficient part load operation of the existing thermal units. The existing system operation principles and market mechanisms do not reveal the full value of flexible generation or demand side options, leading to unnecessary fuel usage by inflexible generation sources.
- Wärtsilä recommends that the EU assess the value of flexibility on the EU level as part of the 2030 targets, and develops market based mechanisms to reward those capabilities, such as flexibility, which enable cost efficient energy savings in electricity generation that are required to integrate the growing amount of intermittent renewables.

How can EU research and innovation policies best support the achievement of the 2030 framework?

- EU research and innovation policies should have a specific focus area on the system level optimisation as part of the 2030 framework to ensure cost efficient integration of renewables. Efficient renewables integration could be achieved with technologies already available today, but the optimal use of these technologies as a part of the power system optimisation requires further research. Aspects in research should include the already mentioned elements of Power System Architecture:
 - Generation capacity mix
 - Geographic locations of loads and generation assets vs. load and grid
 - Optimised grid structure
 - Balancing solutions
 - Energy and dynamic balancing market structures
 - System operation philosophy

4.4. Competitiveness and security of supply

Which elements of the framework for climate and energy policies could be strengthened to better promote job creation, growth and competitiveness?

- Affordable electricity is a prerequisite for the European industry. The impact of affordable energy has been seen in the USA lately, where low cost of gas and electricity has created massive amount of new jobs as industry is returning back to the USA. Well designed power system architecture could ensure an efficient usage of assets leading to lower cost of electricity also in Europe.
- The objectives of each power system are identical: sustainable, affordable and reliable. If the EU is able to create such a power system for Europe, this know-how and experience creates new business opportunities, growth, and new jobs in European industry. Europe should be the frontrunner in optimal power system design.

What evidence is there for carbon leakage under the current framework and can this be quantified? How could this problem be addressed in the 2030 framework?

NO REPLY

What are the specific drivers in observed trends in energy costs and to what extent can the EU influence them?

- The wholesale price of electricity has decreased already during the day time e.g. in Germany due to massive PV output, and we have witnessed low prices also e.g. in Denmark during windy periods. Unfortunately consumers do not see this as at the same time their electricity bill has been increasing. The investment cost in renewables should lead to lower average prices in the medium term, while the share of renewables increase and system operating cost decreases. On the other hand, the system balancing costs will increase simultaneously, and e.g. in the UK system in 2030 the balancing costs may be as high as 30 % of the overall generating costs. However, this cost can be significantly lower, if the right capabilities from generation side are available to create the reserve capacity required. Redpoint Energy has done an analysis on the value of flexibility in the UK power system in 2020 and 2030, showing that with more flexible capacity in the generation portfolio the savings can amount to around 19 % of the annual generating costs (http://www.smartpowergeneration.com/spg/files/library/Flexible-energy-for-integration-of-renewables_Wartsila_2013.pdf). This type of analysis confirms that the EU should focus on the system level analysis when designing the 2030 framework, so that instruments to incentivize the uptake of the right type of capabilities can be designed.
- Another element where the EU should have a clarified position is the role of gas in future electricity generation. In the USA, the cost of electricity has decreased significantly after the shale gas boom, but the EU has not defined its position on shale gas yet. Gas generation will have a remarkable role in the European power system in 2030, as it is the optimal fuel for intermittent renewables balancing. Indigenous shale gas production, development of LNG and the gas grid network, and development of flexible gas contracts would increase competition in the gas supply side leading to lower cost of electricity to the consumer.

How should uncertainty about efforts and the level of commitments that other developed countries and economically important developing nations will make in the on-going international negotiations be taken into account?

- Europe should be the frontrunner in future power system development. Now the EU needs clear political targets and a way forward, which is not dependent on the development of international negotiations or policy directions of other countries. The energy system development requires long term commitment and clear targets, which cannot be changed whenever other countries modify their energy policy direction. The EU should have a clear position in the on-going international negotiations, but the 2030 targets or the implementation of the energy policy cannot be dependent on the outcome of these negotiations.

How to increase regulatory certainty for business while building in flexibility to adapt to changing circumstances (e.g. progress in international climate negotiations and changes in energy markets)?

- As stated already in this response, the EU has basically two alternatives to ensure investments in new resources: a) rely on market-based approach or b) increase regulation and role of central decision-making. To increase regulatory certainty while building in flexibility to adapt to the changes in the market environment, the market-based option provides a more straightforward and transparent approach. Clear targets and commitment to a market based solution are required from the EU level to adopt this approach. Wärtsilä understands that there are some uncertainties and political risks in the market based approach (volatile prices, price spikes, capacity adequacy issues), but these risks can be mitigated, and eventually this approach will lead to lower costs to the consumer, especially in a power system with a high share of renewables.
- A transparent market based approach with a certain level of regulation definitely provides better flexibility to adapt to changes, and more importantly moves the risk of wrong investment decisions from consumers to investors. As the well functioning market approach should guarantee efficient market entry and exit, the changes in the energy markets can be transferred into the efficient investment and market exit decisions by investors, whereby there is limited need for further political interventions. Of course this requires strong commitment from the political front, and adaptation from European utilities. However, there are market examples (e.g. Australia) where the market based approach has provided security of supply and generated new investments in generation and demand side solutions.

How can the EU increase the innovation capacity of manufacturing industry? Is there a role for the revenues from the auctioning of allowances?

- NO REPLY

How can the EU best exploit the development of indigenous conventional and unconventional energy sources within the EU to contribute to reduced energy prices and import dependency?

- NO REPLY

How can the EU best improve security of energy supply internally by ensuring the full and effective functioning of the internal energy market (e.g. through the development of necessary interconnections), and externally by diversifying energy supply routes?

- The most cost efficient way to improve security of supply internally is definitely through the development of a well functioning and transparent internal energy market. A prerequisite is that all forms of generation are integrated into the market, the costs of system operation are visible for market players, the costs are targeted efficiently, and there are efficient and liquid short-term markets available for electricity and flexibility. The implementation of these improvements requires changes in the existing ways of operating the system, and therefore Wärtsilä encourages and supports the ongoing network code development.
- It should be recognised that the market based approach does not prevent the implementation of "last resort" mechanisms like strategic reserves, but it is essential that these mechanisms do not distort market pricing signals. For instance, TSOs could still

contract reserves through markets as a last resort option for balancing purposes. Nevertheless, the cost allocation and pricing of these reserves needs to be market based.

- The development of the internal energy market should be based on a technology neutral approach and competition between alternative options. E.g. the EU should not fix the development of new interconnector investments without analyzing the other sources of flexibility. If all sources of flexibility (interconnectors, storage, demand response, and flexible generation) could compete on an equal basis, the market players should be able to invest in the most attractive alternative. Wärtsilä recognises the issues with market based interconnector investments, but on the other hand, encourages finding ways to more market based solutions also in infrastructure planning.
- Externally the improvement efforts should focus, but not be limited to, LNG infrastructure development in Europe, which enhances competition in the gas supply side leading to potentially lower gas prices in Europe.

4.5. Capacity and distributional aspects

How should the new framework ensure an equitable distribution of effort among Member States? What concrete steps can be taken to reflect their different abilities to implement climate and energy measures?

NO REPLY

What mechanisms can be envisaged to promote cooperation and a fair effort sharing between Member States whilst seeking the most cost-effective delivery of new climate and energy objectives?

NO REPLY

Are new financing instruments or arrangements required to support the new 2030 framework?

- Many market players are calling for a market based approach regarding the EU electricity market structure. It is possible to design an electricity market which provides investment signals for the right type of capacity, and ensures capacity adequacy at the same time. However, this requires a new approach to electricity market design, since old tools are no longer suitable in the changed market environment.
- Today the capacity mechanism is at the center of the EU electricity debate due to risk of capacity shortfalls. While continuously trying to ensure capacity adequacy, adding flexibility to the system should be higher in the agenda. There are potential market based approaches to incentivize investments in flexibility, which do not require administrative cash flows (out of market financing instruments), but call for a reallocation of system costs from the TSO to the market, making the cost of operating a high renewable system visible for market players. To develop a reliable, affordable, and sustainable power system, several actions are needed:
 - Firstly, understand that the energy market environment has dramatically changed

due to increasing amounts of variable RES generation, and this new environment requires increased system services (flexibility).

- Secondly, recognize the value of flexibility and make it visible for market players through cost reflective imbalance prices and by developing short term energy markets.
 - Thirdly, create a transparent market place explicitly for flexibility enabling efficient procurement of system services, and providing clear market signals for investors in flexibility.
 - Fourthly, ensure market entry for new players and bankability of new projects by introducing a capacity market, if the Energy and Flexibility markets are not delivering the investments.
 - To avoid the risk of “locking-in” a wrong type of capacity, it is important to note that steps one to three are implemented before step four is considered.
- Based on the above stated proposal, Wärtsilä sees that new out-of-market financing instruments should not be implemented before the electricity market framework is developed to meet the existing and upcoming challenges (notably renewables integration).