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The new EU Electricity Package, repackaged as a Six Hands Christmas Wish List...

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Highlights

- The eight legislative proposals in the “**Clean Energy for all Europeans**” Package are the answer of the European Commission to ultimately deliver an affordable, sustainable and reliable European Power System for present and future generations.
- As electricity is to become – by far – ‘The’ energy driver for the decades to come, Europe’s experience in this industry is a major asset to (re) take a leadership position. We, the three authors with six hands, jointly believe that this package provides an excellent proposal to achieve a significant step forward for the Internal Energy Market, empowering and servicing energy consumers, improving energy markets to optimise European resources, increasing shares of renewable energy and reducing energy consumption.
- For this to happen, it should not come as a surprise that some principles, rules, processes and, as a matter of consequence, decade-old procedures have to be revamped or replaced. Some of the proposed changes in this Package are of this nature. Not surprisingly, Member States and many interest groups from the traditional industry oppose some of the changes, especially the ones that reduce national and company control over ‘their’ Power System.
- Seeing the danger of ending with a watered down version of the **Clean Energy for All Europeans** Package, we have taken the initiative to give you our 2017 Christmas Wish List made with four electricity topics taken from the 2016 Package: (1) Security of Supply, (2) Demand Response, (3) Energy Communities, and (4) Regional Operational Centres.

1. Security of electricity supply: national challenges with a clear European response

In the field of energy, security of supply is a main concern of any political decision maker. To a certain extent, should a blackout occur, the Minister of Energy should consider to step down.

However, since the beginning of the Internal Energy Market, Member States have refused to define the elements of a European security of supply framework, as witnessed by the two directives of the Council on security of supply (2004 for gas and 2005 for electricity) which do not recognise any EU competence to deal with a supply disruption. The best evidence of their national posture was their refusal to base these directives on internal market provisions and to reject any competence of the European Parliament. It was conceived as a matter of national sovereignty.

Just a few years later, the Russian gas supply disruption of January 2009 demonstrated the emptiness of the 2004 directive to address the crisis effectively and operationally. In response, the Ministers of Energy mandated the quick adoption of a European regulatory framework establishing a coordinated response in case of disruption; requiring first a common assessment of risks and the subsequent establishment of preventive and emergency action plans. The sense of urgency gave rise to the fast adoption of a far-reaching regulation on security of gas supply directly applicable to all as of 2010.

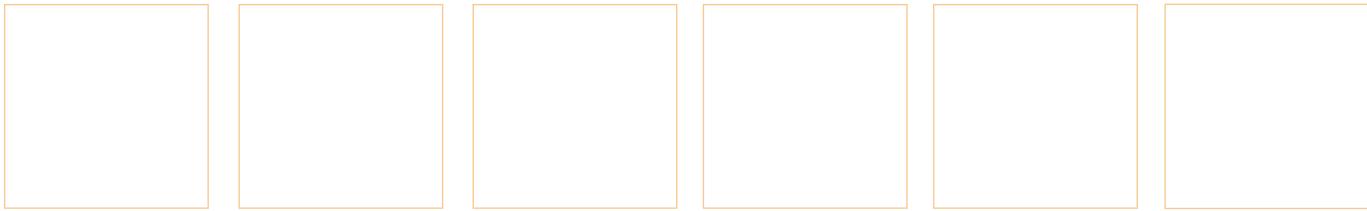
That regulation has been amended this year, 2017, to introduce a stronger obligation of solidarity between the Member States, and more regional cooperation. This regulation majorly accelerated the integration of the internal gas market, with the obligation of reverse flows on all interconnectors and the N-1 infrastructure standard. Since then, gas is flowing in all directions throughout the EU, whatever its origin, tremendously enhancing security of supply.

On the contrary, the field of electricity did not “benefit” from a full-blown crisis, like the 2009 gas crisis, although a significant number of situations could have entailed a serious disruption (cf. Italian-Swiss blackout in September 2003; the German-born European blackout in November 2006; French shortage and German rescue in February 2012; Belgian shortage in August 2014; EU power shortage in January 2017). Nevertheless, it was thought that the internal market directives and regulations, completed by the network codes, were sufficient to guarantee the sacred balancing of supply and demand, in all circumstances.

As shown in the explanatory memorandum of the proposed Regulation on risk preparedness in the field of electricity aiming at replacing the empty 2005/89 directive, the present regulatory framework proved to be very insufficient. Tensions in some countries led governments to question the generation adequacy level in a narrow-minded national approach, showing their mistrust in the functioning of the European market and – even more – in the ability and willingness of their neighbours to help them in case of power supply shortage.

National authorities, pushed by their incumbents and already shaken by the renewable revolution, introduced capacity remuneration mechanisms to ensure the economic survival of centralised generation and to cope with possible demand peaks. This simultaneously undermined the functioning of the internal market and the optimisation of the European power resources. In some countries, however, the threat of power shortages helped discover the flexibility that demand response offers and its possible participation in the wholesale market: an essential discovery as demonstrated under section 2 below.

The core paradigm of an electricity system with a rising share of variable renewable energy sources, based on the real-time matching of supply and demand, requires taking into account all available



resources in the European market, including centralised power plants, decentralised generating entities, storage capacities, individual prosumers, or industrial consumers. The digital revolution, which is profoundly impacting the electricity system, brings new opportunities that should be seized for the benefit of the consumers and climate.

It is essential not to let the narrow national concept of security of supply undermine this revolution by ignoring the cross-border dimension of the electricity market, the many interfaces between the various layers and players of the system and the huge potential of renewable electricity, storage and active demand response.

In line with the efforts already made to create a functioning European electricity market, a general European framework is needed to define the essential elements of security of supply. These elements include a common methodology for assessing generation adequacy, the empowerment of the TSOs to take cross-border responsibility (see section 4 below on regional operational centres), as well as a common framework for national interventions such as capacity remuneration mechanisms, today falling under state aid rules, and other subsidies affecting generation and price signals. Markets, industry, intermediaries and consumers are unfortunately still faced with a multitude of provisions scattered among many different national or European directives, regulations, guidelines, codes which may prevent the system to be as secure as it could be.

The “clean energy for all” policy should also mean secure energy that is affordable for all. The complexity of the system, which is real and increasing, should not lead the decision makers to make it even more complex in regulatory terms. If the European market is seen as the best and cheapest way to optimise European natural resources and infrastructures, including the demand side, it should also be based on well-articulated rules, with the explicit assignment of responsibilities, to govern the European cooperation

of Member States, regulators and players to manage the European system.

The present lack of vision and ambition of most decision makers may prove very costly to all Europeans, by adding a very significant premium to ensure security of supply. Addressing it within national borders is the surest way for all to pay more than embracing the genuine European dimension based on strongly interconnected power systems and the interdependencies, which have existed for 20 years and were created to establish the internal market. Bringing both security of supply and internal market in line is an urgent task to achieve with this package.

2. Demand Response and Aggregators

Dispersed variable resources, renewable energy and flexible demand induce the need for a better and faster coordination between market parties. Recognising the need and the potential benefits, the Package seeks to ensure market access that supports pooling of flexibility services offered by end consumers (demand response, local generation) through new market parties called Aggregators. These new markets entrants make Demand Response easier to deliver to their customers by providing control signals, adequate instrumentation and financial incentives to lower or increase their consumption upon request. This kind of explicit flexibility is highly needed to compensate the variable injection from solar and wind generation.

As demand response is a by-product of assets needed for other purposes (cooling or heating, co-generation, industrial processes, etc.), the reservation cost is much lower than for power plants (mostly gas today). On the contrary, the activation cost is typically higher than for power plants as it implies the interruption of an industrial process, for example. As TSOs use the lowest marginal cost of generation (the so-called merit order model) to select the resources to activate, the natural tendency will be

to activate generation instead of demand response, de facto neglecting the total cost that is cheaper for demand response. Thereby, this flexibility is a cost-efficient alternative to the sourcing of balancing needs from power plants for which, ultimately, payments will be required by their owners to keep their plants available (e.g. capacity payments or strategic reserves). Flexibility services may also postpone or counterbalance network investments and thereby decrease the total electricity bill for consumers. In most Member States, however, current regulatory schemes tend to support investments (capital expenditures) rather than the purchase of flexibility services (operational expenditures), leading to a risk of inefficient investments, particularly given the fast-changing context for the decades to come.

The Package intends to profoundly change the current state of play, fostering market access for Aggregators and limiting the burdensome technical qualification and approval processes put in place in many Member States. The reasons for the European Commission to intervene are related to two major issues. Firstly, TSOs and DSOs are usually critical to demand response, still being perceived as new, unproven and less reliable than power plants in delivering a given amount of energy in a given timeframe. While the experience in some Member States and the US shows that Aggregators provide an excellent reliability even for the most stringent fast reserve, there are still many ways to relegate these flexible services by establishing technical constraints that only power plants satisfy. Secondly, Aggregators and Active Consumers are seen as low-cost competitors in the “last” high-value service offered by generators, being a fast reserve to balance in real-time generation with demand. Thirdly, when demand response is activated to reduce consumption among the customers of an Aggregator, their energy suppliers – through their balance responsible parties – are faced with both an unplanned reduction of their delivery and, consequently, of an imbalance for which a penalty may have to be paid. In practice, a minimal amount,

for the time being, but still an argument used to delay full market access to aggregators. It is therefore not surprising that conventional suppliers are not promoting Aggregators and Active Consumers, and are keen to avoid that these new market parties would benefit from special rights. This is also the reason why mainly suppliers and generators oppose the Package proposal to exempt Aggregators from paying compensation to balance responsible parties each time flexible resources are initiated. Nevertheless, the proposal gives to Member States the right to exceptionally require Aggregators to pay compensation.

Most Aggregators agree with keeping balance responsible parties neutral to Demand Response. Thereby, the mechanism to setup is not technically difficult in practice but market parties that do not want, for commercial reasons, to provide the needed information, block its implementation. Given this context and to allow the development of Demand Response, the Package considers that, at the early stage, the unbalance induced by Demand Response is negligible when compared with usual real-time imbalances that are induced by differences between forecasted consumption and planned generation. It will take some time before the volume of energy and the number of occurrence of Demand Response will financially impact balance responsible parties substantially.

Therefore, the Package should remain unchanged for Demand Response, Aggregators and Active Consumers, as it will, 20 years after the first Directive on the Internal Electricity Market, finally recognise Demand Response as a valuable resource for modern power systems. In the coming years, there is no doubt that an acceptable solution for all parties will be found to compensate balance responsible parties, thanks to the experience that will be built in the meantime. Delaying this part of the Package will significantly hurt the evolution towards higher shares of renewables while increasing the cost for consumers therefore, it should be avoided.

3. Energy Communities

This new proposal by the Commission could not have the same meaning 20 years ago, at the time of the first directive. Today, it is fully in line with the new consumer-centric energy system advocated by the Energy Union: a democratic move. Additionally, the present electricity sector is to be deeply shaken by a “3D revolution”.

1. **“Decarbonization”:** which implies a radical change in energy sources, technologies and the consumption behaviour.
2. **“Decentralization”:** pushed by renewables, which can down-size generation units to x1 kW or x1 MW, also the size of consumption units, permitting a powerful two way direct matching between generation and demand, that could be called ‘prosumage’: the end of ‘utilities’ as unavoidable intermediaries.
3. **“Digitalization”:** which will allow new operation principles and new trade arrangements expressing individual consumers’ willingness or expectations, specific commitments of producers, grids or intermediaries, and the emergence of new advanced services, with smart protocols to follow step by step their due implementation. At a point, in this future, a significant or large part of the electricity system would be made of small size, green and smart, active “system units”.

Therefore, there is no longer a need to know the precise reason behind the Commissions surprising new proposal which would give a European legal recognition to a new landscape and actor, so far and so alien from the competitive EU single energy market that the previous directives were pushing for. An *Energy Community* would look like a local entity which will never be a pure market player or commercial undertaking. While being offered to be a “360° catch-all unit”, which might bundle all that the standard EU frame tries to separate: generation, grid, supply, aggregation, storage, consumption,

electrical vehicles and their charging stations, energy efficiency, circular economy, etc. Plus a “social body” which might link any of its decisions for asset investment, technology choices, operation rules, service offer and tariffs, to preferences for “common good”, being as local as the energy community members’ selfish “common good”, or being as global as any sustainable energy & climate change goal. It even goes beyond energy itself, by tackling “energy poverty” – which is a pure “merit good” policy, derived from a social philosophy about solidarity between human beings and respect for human life.

Of course, this proposal did not stay unnoticed, while only lightly defined in the published drafts (*Dir. Market Design*, Art 2.7, Art 16; *Dir. Renewables*, Art 2, Art 22). The leading European players, from the 2nd and 3d Directives’ landscape, frankly reacted, similarly, whether being national energy regulators; incumbent utilities, and their still bundled DSOs; or European grouping of more proactive DSOs. They also think that the Commission is opening too many rights to this new player, and too softly defining its duties. They underline that all existing EU principles, rules and regulations related to market design, system operation, grid regulation, and individual consumers rights, should stay valid and be applied to Energy Communities under the direct control of existing national regulatory authorities. The expressed concerns are legitimate since this new proposal opens so many doors. However, in an era filled with changes, as with the “3D”, why should we open all new doors from the former regulation equilibrium constructed to build a pre-3D European single market? Is the existing “EU Business-as-usual” regulation the best bridge to our EU new future?

- **First: “Decarbonisation”.** It implies much more than greening the existing park of generation and grid assets and the feeding of consumption devices. It implies searching for new consumption behaviour, and new matching between energy sources and consumption. It implies getting attention, awareness, and social acceptance by

millions of citizens. It implies experimenting. It implies increasing willingness to adapt and to change. Decarbonization has to become visible and palatable to many, if not all, parts of our societies, hence at the whole bottom: at the local (think cities, up to the 40 large world cities alliance) and community level.

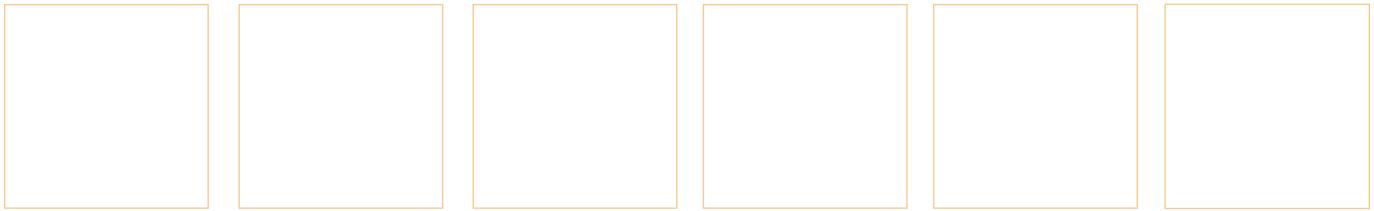
- **Second: “Decentralisation”.** Leading renewables technologies are pushing for decentralisation because they tap decentralised energy sources such as wind and solar, which do not perform as well when concentrated, like concentrated solar (counter-factual is, obviously, off-shore wind farms, which promise a lot with x100 MWs). The decentralisation of key renewable energy sources is mainly a fact. It implies that many existing communities are impacted by any substantial growth of renewables generation. Moreover, many of them are offered to become active players in that new field of investment, technology and operational choices. The opportunity to create new consumption tracks and behaviour, and directly chain them to generation, system and grid choices, and the building of new operational principles, is historical. Decarbonization, to succeed in the long run, the 2050 horizon, will need to form a more profound link with human communities, including the undertaking of ‘universal access to energy’. Decentralised decarbonisation could also become a platform on which to build new communities of voluntary pioneers, willing to collectively act locally in the big XXI Century world transformation, open by this decarbonization and decentralisation wave. It is entirely a part of the democratisation process promoted by the Energy Union.
- **Third: “Digitalisation”.** We have seen in the past 30 years computers and information technologies (large databases linked through the internet and feeding deep learning algorithms) permitting an era of open wholesale, and later, open retail markets for electricity. Without this ICT revolution, the

power markets would not have been open. The new wave of digitalisation we are entering in is pushing this information and “control-command loops” changes at new extremes. Individual “real time” actions & behaviour; individual “spatial locations”, with nodes and spots measured flows, pressure, temperature, etc.; individualised and tracked blockchain exchanges; up to “internet of things”, “big data” and “artificial intelligence”. As self-driving cars are starting to run in Arizona, other radical novelties will occur between the “willing”. They will find it either on commercial platforms, like Uber or Airbnb, or, in closed “non-for-profit” communities of pioneers built as “energy data & assets sharing clubs”. Both the socially engaged, and the wealthy – or less wealthy – enthusiasts will join, investigate, innovate and create in their groups, of various and contrasted social colours. Be they inherited from the past, such as the rural; or home-made and futuristic, when built on ICTs and social media.

It is not yet known how to take the many steps towards low-carbon 2050 goal. It is known, however, that human beings differ by willingness to engage, to risk, to change and to share. Hence, it would be very wise not to regulate ex-ante all the “one thousand flowered sandboxes” of consumers empowerment with all the existing regulations inherited ex-post from two decades of EU fight with entrenched and vertically integrated national energy champions.

4. Regional Operation Centres

Only three decades ago, power was generated within national borders using centrally dispatched power plants. Long-term investments, as well as daily operations, were assessed nationally, based on local demand forecasts, efficiency gains for next-generation power plants and a few long-term agreements for cross-border reserve capacity. Plant operators were informed the day before and instructed by the hour about the amount of electricity to generate. Each national transmission grid operator assessed



the power that would flow through its grid at peak time, checking potential overload situations and determining remedial actions. Surrounding grids were limited to a small ring area, and interconnectors were simulated as centrally dispatched power plants located at the border. Needless to say that assessing generation adequacy and balancing generation with demand had a strictly national focus in those times.

This is exactly what the new Package wants to change once and for all with the creation of Regional Operational Centres (ROCs), a prerequisite for a “Power System for all Europeans”. Today’s reality cannot be compared with the past due to several major elements. Elements such as the fast increase of wind and solar generation; power exchanges encompassing several Member States; cross-border exchanges contracted by the hour (becoming 15 minutes); and fossil fuel power plants more and more filling the gap between renewable generation and demand. Tomorrow will bring even more changes. The interconnected “horizontal grid” (mostly 220kV and 380kV lines and cables) will witness huge variable power flows from Northern (wind) and Southern (solar) Europe to demand centres. The “vertical grids” (from large substations to final customers) will manage flows in either direction depending on weather constraints, virtual power plants combining local generation with demand response and storage, a growing share of electrical vehicles, etc. It is also at this level that the “Internet of Things” (from grids to industry and residential) will favour demand response and allow local energy communities to become market actors.

The “national” character of each power system will be mostly gone while the roles and responsibilities attributed through the years to generation, transmission and distribution grids, and consumers will have to adapt and blend to some extent. In this context, ROCs are a prerequisite for merging certain duties of national transmission system operators that will deliver more reliability, at less cost for all European consumers. So why are some stakeholders,

generally supportive of the Package, opposed to the advent of ROCs or asking to delay this part of the Package for clarification purposes?

Arguments found in their position papers include liability issues; recently approved network codes; current Regional Security Coordination Initiatives; an increase in complexity; governance of the ROCs; increased digitalisation leading to cybersecurity risks; and even a potential decrease in reliability. Although some of these issues are substantial, they can be overcome and should not delay creating ROCs as proposed in the Package. Cascading liabilities between a ROC, its member TSOs and their respective DSOs need to be tackled anyway. Firstly, because the current cascade between a TSO and the DSOs needs to be adapted as most of the new generation capacity is connected to distribution grids. The operation of a power system, traditionally a TSO duty, will have to be shared with DSOs, blending their traditional roles and responsibilities. Secondly, the inherent variability of renewable energy sources and the strong meshing of European grids will bring the model of connected (national) electricity islands to its limits. Thirdly, enlarging the grid under consideration immediately delivers benefits when dealing with congestion management or procurement of reserve and balancing resources. In other words, tackling liabilities with a “horizontal and vertical grids” perspective cannot be escaped, and the advent of ROCs will ultimately simplify the management of the European-wide power grid.

All other issues that are put forward by market parties are not strictly related to the creation of ROCs. Network codes, even if only recently approved, will have to be updated to take into account the fast-changing context. The codes, as any other piece of legislation, should not slow down progress. ROCs strengthen the added value of the Regional Security Coordination Initiatives and enhance their transparency. ROCs do not increase grid complexity, digitalisation or cybersecurity risks. The latter result from more and more (decentralised) variable



generation, new technologies and internet-based services. On the contrary, ROCs have the power to aggregate a part of this complexity and to act against cyber risks, at least, for the “horizontal” European grid. Finally, the monitoring of ROCs by regulators has the potential to create a level playing field among the Member States, avoiding national reflexes when, for example, dealing with generation adequacy or congestion issues with cross-border consequences.

ROCs will also benefit from a regional view on the available generation and transmission capacities. This unbiased view will ensure that all available resources, whether generation or demand response, are used to secure the short to the long-term security of supply. For this reason, ROCs are an essential tool when contemplating higher shares of renewable energy sources in Europe. For the reasons briefly outlined, the proposal of creating ROCs, as put forward in the Package, should remain unchanged in the final document approved by the Council and the European Parliament. Delaying ROCs or watering down their role and responsibilities will be detrimental to all consumers and delay the emergence of an efficient and reliable power system delivering Clean Energy for all Europeans. It is an essential element of the concept of European security of supply that is needed to underpin the internal market.

5. Conclusion

We, the three authors with six hands, have been: Director for the internal market at DG Energy (Jean-Arnold); CEO of a national TSO & President ENTSO-E (Daniel); academic researcher dedicated to the regulation of market-based power systems for 25 years (Jean-Michel). We jointly believe that this Package provides an excellent proposal to achieve a major step forward for the Internal Energy Market, empowering and servicing energy consumers, improving energy markets, increasing shares of renewable energy and reducing energy consumption. For this to happen, after seeing the danger of ending with a watered down version of the **Clean Energy for All Europeans** Package, we have taken the initiative to give you our 2017 Christmas Wish List made with four electricity topics taken from the 2016 Package: (1) Security of Supply, (2) Demand Response, (3) Energy Communities, and (4) Regional Operational Centres. Make up your minds as we did; and Merry Christmas to all Europeans!



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