

Realising the benefits of European market integration

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Enhanced market integration could deliver huge net benefits to Europe's electricity consumers, primarily through lower wholesale energy prices, a more coordinated and economic approach to resource adequacy, and facilitating the integration of renewable energy sources through balancing the system over wider areas. Delivering these benefits will involve a more regional or coordinated approach to market and system operation and to regulation. The European Commission's Clean Energy for All Europeans (CE4All) package represents significant progress in this direction. However, negotiations around the package will make or break progress on regionalisation for the next decade. There is a danger that the amendments to the Commission's proposals put forward by the European Council and to a lesser extent by the Parliament, if accepted in the trilogue negotiations this year, could fundamentally weaken the regulatory and operational framework needed to realise the substantial consumer benefits of regionalisation.

When considering specific issues related to governance, planning, and power system operation, it is easy to lose sight of the overall benefits to consumers that regionalisation and market integration can deliver. This paper serves to remind readers of those benefits and emphasises the fundamental importance of regionalisation and market integration in the cost-effective, reliable transition to a decarbonised power sector based on renewable energy sources. It also provides recommendations on how to maximise the consumer and environmental benefits of market integration in the CE4All package negotiations.

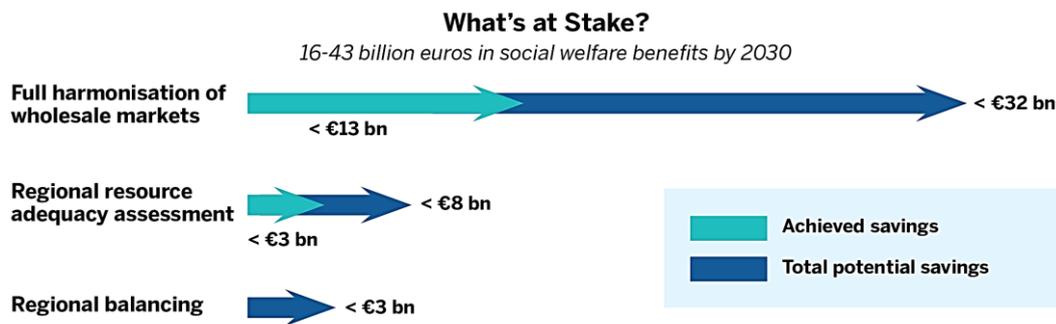
Potential benefits of market integration

The outcome of market integration is that, at a regional and ultimately Union level, demand is met securely by the most economic resources. Estimates by Booz & Co.¹ and the

¹ Booz & Co. (2013). *Benefits of an integrated European energy market*. Retrieved from the European Commission website: https://ec.europa.eu/energy/sites/ener/files/documents/20130902_energy_integration_benefits.pdf

Commission² suggest that the potential increase in social welfare of fully integrating Europe's electricity markets could lie in the range of €16 billion to €43 billion annually by 2030, depending on the extent to which Europe's generation portfolio is optimised, the development of adequate interconnector capacity, and the widespread application of demand response. As shown in Figure 1,^{3,4} the bulk of the increase in social welfare would accrue through harmonised wholesale energy prices, with smaller but still significant savings arising from adopting a more collective approach to resource adequacy and shared balancing.⁵

Figure 1. Estimate of achieved and potential savings from European market integration (by 2030)



Based on: Booz & Co. (2013). Benefits of an integrated European energy market; and European Commission. (2016). Commission Staff Working Document Impact Assessment, Part 3/5

The foundation for realising these benefits was laid by the Third Energy Package, the full implementation of which remains to be achieved. However, progress in integrating Europe's wholesale electricity markets and the delivery of the associated benefits will rely on a more European or regional approach to system operation. Inevitably this will involve the transfer of some of the planning activities currently carried out by individual transmission system operators (TSOs) to regional operational entities. In turn, the establishment of these regional entities with evolving responsibilities will require the development of an appropriate regulatory framework, capable of adequately monitoring their activities and performance. Simply depending on cooperation among TSOs through the European Network of Transmission System Operators for Electricity (ENTSO-E) and cooperation among national regulatory authorities through the Agency for the Cooperation of Energy Regulators (ACER) is unlikely to provide the necessary framework to support a fully integrated, secure, and efficient European electricity market or transmission system.

Forging a more integrated and collective approach to operating Europe's transmission system is a centrepiece of the Commission's electricity market design initiative. The ambitious proposals set out in the recast Electricity Directive and Regulation—which reinforce and clarify current legislative requirements to maximise interconnector capacity made available to the wholesale markets, and which require a more harmonised and collective approach to resource adequacy and balancing—are all directly relevant to achieving the benefits that progress to a fully

² European Commission. (2016). *Commission Staff Working Document Impact Assessment, Part 3/5*. Brussels: Belgium. Retrieved from: https://eur-lex.europa.eu/resource.html?uri=cellar:e4c834ae-b7b8-11e6-9e3c-01aa75ed71a1.0001.02/DOC_3&format=PDF

³ Booz & Co., 2013.

⁴ European Commission, 2016.

⁵ While the harmonisation of wholesale prices across Europe would increase prices for some and decrease prices for others, the ability to access the cheapest resources would increase social welfare through an overall reduction in energy prices.

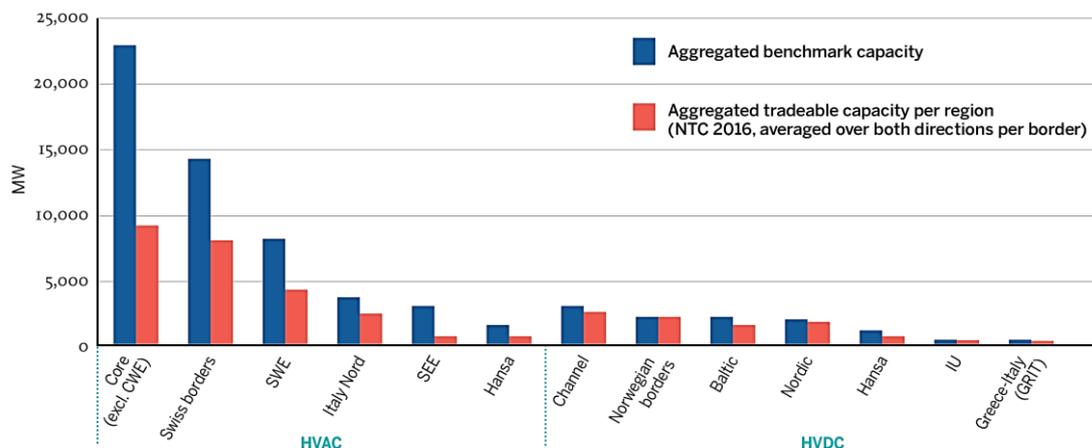
integrated electricity market can deliver. Despite the relevance and necessity of the Commission’s proposals, however, there has been some pushback from the Council that could undermine progress to a more coordinated approach to system operation and the delivery of a fully integrated and efficient electricity market. Amendments put forward by the European Parliament are generally more helpful; however, in the important area of maximising cross-border capacity made available to electricity markets, the impact of these proposals would be negative.

The following paragraphs look at the Commission’s proposals in these areas and how amendments proposed by the Council and European Parliament could undermine progress.

Increasing available interconnector capacity

As price convergence is the vehicle that will deliver gains in social welfare, clearly more needs to be done to increase the cross-border interconnection capacity made available to the wholesale markets. Although investment in new capacity will be required, there is considerable potential to increase the utilisation of existing interconnector capacity. Analysis by ACER,⁶ summarised in Figure 2, shows that currently only about a third of the realistically available cross-border capacity is offered to the market in the Core (excluding the Central Western) region.⁷ In some instances, offered capacities are even lower, for example only 12 percent in the case of imports to Germany from the Netherlands, even though 83 percent is made available for flows in the opposite direction.

Figure 2. Aggregated tradeable interconnector capacity compared with benchmark



Source: ACER and CEER. (2017). Annual report on the results of monitoring the internal electricity and gas markets in 2016.

A significant factor behind the low levels of interconnection capacity made available to the wholesale markets is the restriction of cross-border flows to reduce internal congestion—a

⁶ Agency for the Cooperation of Energy Regulators and Council of European Energy Regulators. (2017). *Annual report on the results of monitoring the internal electricity and gas markets in 2016: Electricity wholesale markets volume*. Retrieved from: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Market%20Monitoring%20Report%202016%20-%20ELECTRICITY.pdf

⁷ The Core region covers the United Kingdom and the majority of continental Europe: France, Germany, the Benelux countries, and Iberia.

practice adopted by a number of Member States. An example is the interconnection between western Denmark and Germany, which is regularly curtailed to reduce German imports and has experienced a significant decline in interconnector utilisation over recent years.⁸ In June 2017, the German and Danish authorities reached an agreement to halt this decline. However, the continuing practice of limiting interconnector capacity to manage internal congestion resulted in the Commission launching an antitrust investigation against TenneT, the German TSO, in March 2018.^{9, 10}

Although reducing internal congestion by this means can reduce the need for redispatch and consequently the short-run costs seen by individual Member States, it does so at the long-run expense of consumers in those Member States and in the region as a whole who are denied the gains in social welfare that would result from increased cross-border trading. For this reason, Article 16 of Regulation EC 714/2009¹¹ requires that the interconnector capacity made available to the market be maximised, provided security of supply is not compromised. At the same time, provision 1.7 of Annex 1 of EC 714/2009 specifically prohibits the practice of resolving internal congestion by restricting cross-border flows, unless necessary to maintain network security. Despite the legal requirements, ACER's analysis shows that, through the exploitation of derogations, the practice of "moving internal congestion to the borders" is widespread. This is all the more remarkable given that the practice represents a clear constraint on cross-border trade.

Commission's proposal and current status: Interconnector capacity

Article 14 of the proposed Regulation on electricity markets¹² attempts to reinforce and clarify the existing legal position by stipulating that redispatch and countertrading should be used to maximise cross-border capacity, provided that security is not compromised and that it is economically beneficial to do so "at a Union level." However, some Member States are resisting this, and the Council and Parliament have put forward similar watered-down compromise proposals. These would allow interconnector capacity offered to the market to be increased linearly, starting at the level of capacity offered to the market at the point of enactment and rising to 75 percent of maximum after four years or by 2025.¹³

The amendment the Council and Parliament proposed is undesirable on a number of levels.

⁸ Swedish Energy Markets Inspectorate. *Reduced capacity on the German-Nordic interconnectors: Regulatory framework and socioeconomic effects on the European electricity market*. Retrieved from: https://www.ei.se/Documents/Nyheter/Nyheter/2017/Rapport_EI_NVE_Reduced_interconnector_capacity_170616.pdf

⁹ The German and Danish authorities agreed to gradually increase interconnector capacity to 1,100 megawatts by 2020. However, this would still be significantly below the 2,640-megawatt realistically achievable capacity scheduled to be available by that time and would represent a maximum utilisation of only about 40 percent.

¹⁰ European Commission press release. Retrieved from: http://europa.eu/rapid/press-release_IP-18-2122_en.htm?locale=en

¹¹ Commission Regulation No 714/2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003. Retrieved from: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0015:0035:EN:PDF>

¹² European Commission. (2016). Proposal for a regulation of the European Parliament and of the Council establishing a European Union Agency for the Cooperation of Energy Regulators. Brussels, Belgium. Retrieved from: https://eur-lex.europa.eu/resource.html?uri=cellar:2f0ae213-b7b3-11e6-9e3c-01aa75ed71a1.0001.02/DOC_1&format=PDF

¹³ The Council's and Parliament's proposed amendments differ in terms of the definition of what capacity needs to be offered to the market after the transition period, in which a flow-based approach is used. The Parliament proposes 75 percent of the total thermal capacity minus that necessary to secure the system to an N-1 criterion, whereas the Council suggests a slightly more conservative 75 percent of remaining available margin.

First, it represents a significant retreat from the existing legal position. It would legalise and prolong the situation in which individual Member States reduce costs in the short term contrary to the long-term economic and security interests of their own consumers, while European consumers as a whole are denied increases in social welfare. Arguably, it would also encourage those Member States who currently use this practice not to take action before the enactment of the Regulation, to maintain a low starting point to the proposed linear progression.

Second, the 75 percent cap, which is intended to represent the point at which redispatch costs are likely to exceed the benefits of increased cross-border trading, is entirely arbitrary. The point at which costs exceed benefits will vary for each interconnection, and the burden of proof should be on TSOs to demonstrate that this is the case, or that network security will be compromised, before limiting cross-border trade. Imposing a “one size fits all” cap will result in Europe’s consumers being permanently denied the gains in social welfare that a more tailored approach would allow.

The Council’s and Parliament’s proposals are therefore detrimental to the economic and security interests of Europe’s electricity consumers. However, the fact that the Council and Parliament have alighted on a similar position suggests the proposals are likely to prevail. The question arises, therefore, of how the proposed amendments could be improved. One obvious improvement would be to dispense with the “one size fits all” cap and require TSOs to establish the point at which costs exceed benefits in each individual case. This would ensure that each interconnection would be considered individually and consumers would not be permanently denied the gains in social welfare associated with maximising interconnector capacity made available to the market.

Further improvements would be gained by insisting on a higher starting point for the linear progression. The threat of an investigation by DG Competition into possible antitrust violations has prompted TenneT to offer 73 percent of available maximum Denmark West-to-Germany interconnector capacity to the market with a lead-in of only six months.¹⁴ There appears to be no reason a similar position could not be adopted for other interconnections.

Resource adequacy

In addition to the increased social welfare brought about by the convergence of wholesale electricity prices, many European consumers will also benefit from a more Union-level or regional approach to security of electricity supply. Although some Member States are forecasting capacity deficits in the years ahead, others are forecasting surpluses, and, viewed from the perspective of what resources are physically accessible to serve consumers, most Member States are in a healthy resource adequacy situation and are forecast to remain so for some years.¹⁵ Aggregating these surpluses and deficits over appropriately defined regions will reduce the overall need for investment in new resources and allow supply reliability for all consumers to be maintained at a lower cost than would be the case if Member States continue with a “self-sufficiency” approach. It should be noted at this point that significant efficiencies can also be obtained through exploiting the potential of demand response, which can cost-

¹⁴ TenneT TSO GmbH. Proposal of commitments under Article 9 of Council Regulation (EC) No. 1/2003. Retrieved from the European Commission website: http://ec.europa.eu/competition/antitrust/cases/dec_docs/40461/40461_187_3.pdf

¹⁵ ENTSO-E. *Mid-term adequacy forecast: 2017 edition*. Retrieved from: https://www.entsoe.eu/Documents/SDC_documents/MAF/MAF_2017_report_for_consultation.pdf

effectively compensate consumers who choose to be more responsive to unusual system conditions, thereby releasing capacity for use elsewhere.

However, responsibility for security of supply is a matter for individual Member States. If the potential savings in investment costs are to be realised, this responsibility needs to be squared with a more collective approach to resource adequacy assessment. This can be achieved by Member States taking a consistent and appropriate approach to accounting for the potential support from neighbouring systems when assessing security of supply, without impairing the resource adequacy of those neighbouring systems. The outcome of market coupling is that domestic demand is met securely by the most economic combination of domestic and external resources, and it seems logical to reflect this reality in investment timescales by taking appropriate account of support from neighbouring systems when assessing security of supply.

To some extent this already happens. However, ACER's 2017 market monitoring report¹⁶ indicates a wide disparity in the extent to which interconnection contribution is taken into account. ACER's analysis shows that out of 21 Member States surveyed, ten did not consider any interconnection contribution when assessing resource adequacy. Among the remainder, there was a wide disparity in the extent to which such contribution was taken into account. Some Member States such as Portugal assume little contribution; others such as Great Britain assume a significant but still conservative contribution, while some Member States such as the Netherlands assume (possibly optimistically) full commercial capacity. It is also interesting to note that, of the Member States that assume zero or little interconnector contribution, five are implementing or planning to implement capacity mechanisms. As suggested earlier, this prompts the obvious question: Would those mechanisms be necessary if proper account were taken of potential interconnection contribution, to the extent they are necessary at all?

Commission's proposal and current status: Resource adequacy

The failure of Member States to fully take into account interconnector contribution to resource adequacy delays the retirement of existing resources and results in unnecessary investment in new generation capacity, the costs of which will be borne by consumers. Progress in the energy sector transformation will also be delayed. Furthermore, the wide disparity in the level of contribution assumed underlines the need for the use of a common methodology and a coordinated approach to analysis, rather than individual Member States acting independently.

This need for a coordinated approach is recognised in the Commission's CE4All package, with Article 18 of the recast Regulation proposing that Member States monitor capacity requirements based on the Europe-wide assessment carried out by ENTSO-E. The Parliament's proposed amendment improves on the Commission's proposal in that it requires an assessment down to a regional, Member State, and bidding zone level. This should provide the granularity to allow appropriate assumptions about interconnector contribution to resource adequacy, while providing a consistent approach across all Member States. The Council's amendment acknowledges the need for a Union-wide resource adequacy assessment but allows Member States to carry out parallel national assessments and to act to resolve any resource deficits identified by the national study, even if the Union-wide assessment did not indicate a problem. Although Member State responsibility for security of supply requires a national prerogative, the Council's amendment risks perpetuating the current disparate approach to resource adequacy assessments and does little to foster a coordinated approach. If the benefits of a more

¹⁶ ACER and CEER, 2017.

coordinated approach to resource adequacy are to be realised, it is imperative to harmonise assessment methodologies and take a consistent approach to data, availability assumptions, and forecasting. It is also important that assumptions about interconnection contribution are determined on a regional basis.

In those situations where ENTSO-E's resource adequacy assessment indicates a capacity deficit that is used to justify the introduction of a capacity mechanism, the Commission proposes in Article 21 of the recast Regulation that capable non-domestic generation capacity should be allowed to participate. Furthermore, the Commission proposes that the extent to which non-domestic generation can participate in a capacity mechanism should be determined by the appropriate regional operational centre (ROC), rather than by the Member States concerned. This position, which is supported by the European Parliament, albeit with ROCs renamed as regional coordination centres (RCCs), would again ensure a regional dimension to the treatment of external resource participation in domestic capacity mechanisms and promote consistency.

The Commission's proposals for a more coordinated approach should be supported, albeit with more emphasis on regional assessments that would provide the granularity that a Union-wide assessment could not. The introduction of a European assessment with, as proposed by the European Parliament, analysis down to regional, Member State, and, if necessary, bidding-zone level should provide the granularity required to render Member States analysis unnecessary. Regional resource adequacy assessments would allow capacity surpluses and deficits to be aggregated on a regional basis, reducing the need for investment in new resources and reducing the associated costs seen by consumers. The Council's proposal that Member States may continue to assess capacity requirements on a national basis, requiring only that they "take note" of any European assessment and opinion issued by ACER, virtually ensures the continuation of a "self-sufficiency" approach and a failure to deliver the benefits that a more coordinated resource assessment could bring.

The Commission's proposal that ROCs should determine what level of non-domestic generation is capable of participating in a domestic capacity market where these are introduced should also be supported. Determining the ability or otherwise of non-domestic generation to participate in a capacity mechanism is not a task easily undertaken either by the "donor" or "recipient" Member State. Issues of resource location, neighbouring system topology, and status will arise, as well as difficulties in monitoring the availability of resource in an external jurisdiction—issues that are more sensitively addressed from a regional standpoint. Again, the Council's proposal that the entry capacity for non-domestic generation shall be a matter for the "recipient" Member State, albeit taking into account the views of the ROC, risks undermining the benefits that a coordinated approach to resource adequacy can deliver and represents a potential constraint on cross-border trade.

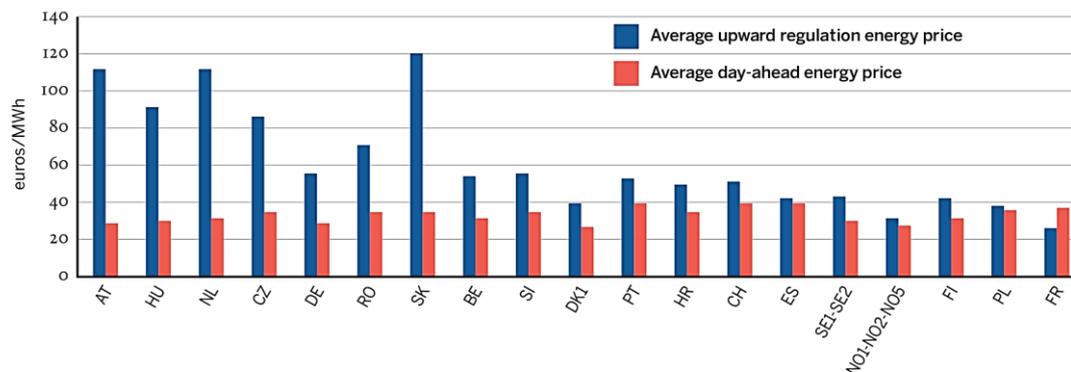
Balancing and the integration of renewable resources

Balancing energy over wider areas will allow geographic and technical diversity to be exploited, reducing balancing volumes. Although technologies such as wind and solar are intermittent in nature, correlation between the output of individual installations drops rapidly with distance, thereby reducing aggregated imbalances. Furthermore, the complementary characteristics of the different technologies captured in larger balancing areas further reduces aggregated imbalance volume requirements.

The need to minimise imbalance costs will assume increasing importance as the deployment of wind and solar continues in pursuit of Europe’s decarbonisation goals. Although analysis suggests that the potential savings in balancing costs will be relatively modest compared with those associated with market integration and a coordinated approach to resource adequacy assessment, the savings to be achieved by balancing across wider areas are still significant at about €3 billion annually by 2030.¹⁷

Until recently, there has been little progress in coordinating national balancing activities in Europe, although progress has been made in imbalance netting.¹⁸ In fact, as shown in Figure 3, analysis reveals that differentials in imbalance prices across Europe are far greater than in the day-ahead and intra-day markets.¹⁹ These price differentials are a consequence of wide differences in national balancing market design, methods of imbalance pricing (e.g., average or marginal), available balancing resources, and national balancing products, and are significant for a number of reasons. Imbalance prices ultimately provide a cap or collar on day-ahead and intra-day prices and will therefore impact the extent to which these prices can be harmonised across Europe. Furthermore, unnecessarily high imbalance prices—for example, where prices are inflated due to a lack of competition or liquidity—represent a barrier to entry. This is particularly true for small entities and intermittent renewable resources, which cannot easily respond close to real-time.

Figure 3. Difference in upward balancing regulation energy price and day-ahead energy price, 2016



Based on: ACER and CEER. (2017). Annual report on the results of monitoring the internal electricity and gas markets in 2016; and author’s own research.

Commission’s proposal and current status: Balancing

The Commission’s recast Regulation on Energy markets supports the aims of the Balancing Guideline, proposing that balancing and reserve capacity be dimensioned and procured on a regional basis. In addition, the Commission proposes that ROCs should have a role in the regional dimensioning and procurement activities. This is eminently sensible and necessary if the benefits of balancing over wider areas are to be realised, and the Commission’s proposal should be supported. The Parliament also proposes that reserve capacity should be sized regionally and that the ROCs or RCCs should have a role in that process. However, the Council’s

¹⁷ European Commission (2016) *Commission Staff Working Document Impact Assessment, Part 3/5*. Brussels: Belgium. Retrieved from: https://eur-lex.europa.eu/resource.html?uri=cellar:e4c834ae-b7b8-11e6-9e3c-01aa75ed71a1.0001.02/DOC_3&format=PDF

¹⁸ Imbalance netting: when TSOs procure balancing reserves and resolve imbalances nationally but offer remaining reserves to a regional platform.

¹⁹ ACER and CEER, 2017.

amendments would relegate ROCs (renamed regional security coordinators, or RSCs) to a purely advisory role, with TSOs responsible for the dimensioning and procurement of balancing requirements, although noting that this “may be facilitated on a regional level.” Exactly what this means is unclear. However, what is clear is that unless reserve and balancing capacity requirements are dimensioned at a regional level and procured by way of a regional platform, potential savings in balancing costs and the costs of integration of renewable resources will not be realised. It is also clear that ROCs should have a role in the regional dimensioning and procurement of balancing services, because their regional focus and expertise will leave them ideally placed to identify and exploit efficiencies associated with balancing over wide areas.

Conclusions

Fully integrating Europe’s electricity market could deliver huge benefits to consumers by allowing access to the lowest cost resources and reducing the costs of ensuring security. It is also critical for the clean energy transition across the European Union. However, to deliver these benefits, market integration needs to be supported by a more collaborative and regional approach to both system operation and regulation.

The Commission’s market design initiative and the proposals set out in the recast Directive and Regulation represent a necessary step in developing this regional approach, although more ambition could arguably have been proposed in terms of regulation. Whereas the position taken by the Parliament on the Commission’s proposals has been positive in some areas and negative in others, there has been considerable pushback by the Council on the issues discussed above, which are related to a more regional approach to system operation. Despite the necessity of the Commission’s proposals, the Council, and in some instances the Parliament, have tabled amendments that reflect a reluctance by Member States to take a more regional approach to system operation or regulation when that involves sharing powers within regional entities such as ACER or ROCs/RSCs. There is no good case to be made for this reluctance on either economic or security of supply grounds. Whereas the Commission’s proposals aim to move regionalisation on to the next level, the Council appears to favour the status quo and, in the case of interconnector capacity to be offered to the market, even proposes a retreat from the current legal position.

In the interest of making progress in the delivery of benefits associated with fully integrating Europe’s electricity markets, the Commission’s proposals should therefore be supported in the forthcoming negotiations. Fully integrating Europe’s electricity markets will have overwhelming benefits for consumers, for security of supply, and for achieving energy and climate objectives, and it will require corresponding progress in regionalising system operation and regulation. The Commission’s proposals are a necessary step in this direction.



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