

Regional resource adequacy assessments: The key to ensuring security of supply at a reasonable cost

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How much is enough?

With over half of the Member States currently implementing or in the process of putting in place capacity remuneration mechanisms (CRMs),¹ the European electricity market is fragmented and far from the single electricity market envisioned by the Energy Union.² A key reason for this lack of cohesion is the current practice of assessing resource adequacy at the national level, which often understates or ignores entirely the benefits of delivering the same security of supply to all consumers in a given region with the regional base of installed resources. As a result, CRMs adopted by Member States (MS) may be superfluous.³

As part of the Clean Energy for All Europeans package, the European Commission proposed an EU-wide resource adequacy assessment for establishing realistic levels of supply security in MS—certainly an improvement compared to current practices. While the European Parliament endorsed the Commission’s proposal, the European Council has effectively rejected it in favour of the status quo; in the Council’s proposal, while MS have to take into account the European assessment, they can still undertake their own assessments and base any decisions on them.⁴

¹ Information based on ACER. (2018). *Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2017*. Retrieved from https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/MMR%202017%20-%20ELECTRICITY.pdf.

² The implementation of CRMs is one of the key reasons for the fragmentation of the European electricity market, albeit not the only one. For a brief overview of key ways to realise the single electricity market, see Kolokathis, C. and Baker, P. (2018). *Regional cooperation and integrated energy markets at risk*. [Blog post]. Retrieved from <https://www.euractiv.com/section/electricity/opinion/regional-cooperation-and-integrated-energy-markets-at-risk/>

³ Baker, P. (2018, October 30). *Britain’s capacity market for electricity: Lessons for Europe* [Blog post]. Retrieved from <https://www.euractiv.com/section/electricity/opinion/britains-capacity-market-for-electricity-lessons-for-europe/>

⁴ Based on the Council’s approach a MS can undertake a national assessment in parallel with the EU-wide assessment. In case the national assessment diverges from the EU-wide one and demonstrates a SoS concern, a MS can still apply for a CRM, after taking into

It is clear from the positions of the two institutions that a compromise will be required. So, what is a reasonable compromise and for what should it aim?

Regional Approach: a win-win compromise

In our recent policy brief, *Realising the Benefits of European Market Integration*,⁵ we highlight the benefits of a strong regional approach to resource adequacy. The cost-efficient allocation of resources among MS could reduce annual costs by up to eight billion euros—costs that would otherwise come out of consumers’ pockets—while keeping everyone’s lights on and reducing the need for new investments. Everyone wins.

We can realise these significant benefits by establishing regional assessments. A requirement for regionally coherent resource adequacy assessments, using a consistent EU-wide methodology, would help to enhance the quality and consistency of the scenarios considered, including the assumptions for the contribution of interconnectors to Security of Supply (SoS).

The current lack of consistency and cooperation among countries is evident across several assessments. Analysis by the Agency for the Cooperation of Energy Regulators (ACER) shows that at least nine MS do not take into account any interconnector contributions in their national assessment, even though MS may rely on energy transfers from neighboring systems to meet demand in real time, while some assume full interconnector capacity contribution (Figure 1).⁶ The predecessor to the current European assessment, the Scenario Outlook and Adequacy Forecast,⁷ was merely a collection of national scenarios. The current assessment, the Mid-Term Adequacy Forecast (MAF),⁸ shows improvements by setting some common assumptions across all countries for its scenarios and sensitivities (with respect to, for example, fuel prices), yet it still lacks the required coherency (for more details see our response to last year’s MAF consultation⁹).

With more than 40 Transmission System Operators (TSOs) being involved in the EU-wide assessment, it is difficult by default to organise an EU-wide working group with the objective of

consideration ENTSO-E and ACER’s opinions on the divergences, without those having any binding effect.

⁵ Baker, P., Hogan, M., and Kolokathis, C. (2018). *Realising the benefits of European market Integration*. Brussels, Belgium: The Regulatory Assistance Project. Retrieved from <https://www.raponline.org/knowledge-center/realising-the-benefits-of-european-market-integration/>

⁶ ACER. (2018). *Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2017*. From those, at least three countries are implementing a form of CRM.

⁷ ENTSO-E. (2015). *Scenario Outlook & Adequacy Forecast (SO&AF) 2015*. Retrieved from https://docs.entsoe.eu/organization/a1b57200-b17a-4786-a206-b1b78247a9e2?_tags_limit=0&tags=soaf

⁸ ENTSO-E. (2018). *Mid-Term Adequacy Forecast 2018*. Retrieved from <https://www.entsoe.eu/outlooks/midterm/>

⁹ See RAP’s response to the consultation on ACER’s *Mid-term Adequacy Forecast 2017*. Retrieved from <https://docstore.entsoe.eu/Documents/SDC%20documents/MAF/maf-consultation-answers.pdf#page=22>. For example, in MAF 2017, ENTSO-E considered a mothballing sensitivity. This sensitivity assumed more than 30 GW of thermal capacity to mothball across Europe at the same time; around 15 GW is assumed to mothball across France, Germany, and Poland in 2020 and 2025. The assessment largely ignored market economics. This is more pronounced in the case of Poland, where about 6 GW of plant is assumed to mothball in 2025, despite already tight margins in the Base Case modelled by ENTSO-E. One would expect prices to increase significantly under such conditions of tightness, thus increasing profitability for plant and creating clear incentives for them to remain in the market, or new resources (e.g., demand response and new generation) to come forward. This is also true for plant from neighboring countries; even though the risks for Germany and France remain quite limited, even after the assumed mothballs, market conditions in Poland (i.e., higher prices) could create opportunities for plant to remain in the market in order to exploit these higher prices.

An obligation to coordinate regionally, a key pillar of the agreed regulation on the Governance of the Energy Union which calls for greater regional cooperation,¹¹ will promote closer collaboration among TSOs and NRAs. This obligation is already enshrined in the recast regulation and directive on the internal market for electricity, legislative files. The ROCs have been set up as cooperative undertakings of national TSOs (a natural continuation of the existing regional security coordinators), with oversight by the NRAs of the region.¹² Similarly the recast directive on common rules for the internal market in electricity calls for close cooperation of the NRAs for the oversight of European, regional, and national assessments.¹³ The Council of European Energy Regulators (CEER), representing NRAs, has supported the assessment of resource adequacy at a regional level using an EU-wide methodology, whilst reserving a role for individual national assessments to the extent they continue to be a useful complement to regional undertakings.¹⁴

In addition, the ROCs are well-suited to the task of coordinating the regional assessments due to their broader responsibilities and deep knowledge of their respective regions. The Commission has proposed tasking the ROCs with estimating the maximum level of foreign capacity that can participate in a CRM and with undertaking short-term security assessments — tasks similar in nature to the resource adequacy assessment. The latter would effectively be a natural extension of their role to investment timescales.

A common, EU-wide methodology essential

In discussions to date, policymakers have often focused on the need to develop a consistent methodology for assessing resource adequacy, and rightly so. The Council of European Energy Regulators recommended a common practice in 2014¹⁵, given the great disparity of methodologies across MS¹⁶. On a similar note, ENTSO-E endorsed¹⁷ the European Commission's proposal to develop a common methodology in the recast Regulation on the Internal Market for Electricity. ENTSO-E is currently in the process of improving its methodology for the pan-European assessment with the involvement of TSOs and other

¹¹ More specifically, the Governance regulation promotes greater cooperation between MS towards the five dimensions of the Energy Union, including security of supply (article 11 of the regulation).

¹² Ref. articles 32 to 44 of European Commission. (2016). Proposal for a regulation of the European Parliament and of the Council on the internal market for electricity (recast), 2016/0379 (COD). Brussels, Belgium. Retrieved from <https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=celex:52016PC0861>

¹³ Ref. article 61 of European Commission. (2016). Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast), 2016/0380 (COD). Brussels, Belgium. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:0864:FIN>.

¹⁴ CEER (2017). *Recommendations on System adequacy & capacity remuneration mechanisms*. Retrieved from <https://www.ceer.eu/documents/104400/5937686/System+Adequacy+%26+CRM/b5dd21e5-3dfc-7e14-963b-d8a6e5852c84>.

¹⁵ CEER. (2014). *Recommendations for the assessment of electricity generation adequacy*. Retrieved from <https://www.ceer.eu/documents/104400/-/4a259d59-6cd0-5342-90a3-1ded82ad1ea5>

¹⁶ CEER. (2014). *Assessment of electricity generation adequacy in European countries*. Retrieved from <https://www.ceer.eu/documents/104400/-/a9517a5f-5a98-2974-dd61-e085c7971b53>

¹⁷ ENTSO-E. (2017). *Clean Energy Package: European Resource Adequacy is welcome, but it needs to respect subsidiarity*. Retrieved from https://docstore.entsoe.eu/Documents/Publications/Position%20papers%20and%20reports/CEP/170315_CEP_Resource_Adequacy_on_e-pager.pdf

stakeholders; ACER is due to scrutinise the final methodology before approving or recommending amendments to it.

A consistent methodology and modelling tool are essential for assessments with different geographical focus to be comparable. Different methodologies across the assessments would mean that no meaningful comparison would be possible.¹⁸ It is also more cost efficient to develop a single, comprehensive methodology and common modelling tool that can be used across any geographical delineation.¹⁹ It is crucial, therefore, that the final agreement of the recast regulation ensures the use of a common methodology and modelling tool to assess resource adequacy, based on ENTSO-E's widely reviewed and scrutinised work.

Establishing regional assessments – the details

The regional assessments would be coordinated by the ROCs and require an agreement between the TSOs and NRAs of a given region. These would be complemented by the EU-wide assessment, which would establish the EU-wide methodology, as well as the high-level scenarios across Europe. In addition, MS would have the option to undertake national assessments, recognising their legitimate interest in ensuring national SoS is met. This approach also acknowledges that MS may consider the move to an EU-wide assessment alone to be a leap too far for the time being. We would expect that as regional assessments are introduced and get established, confidence in them will grow and eventually national assessments will be phased out.

Below we explain the proposed process for the development of the scenarios and data, the governance structure, and the decision-making process.

Scenario, sensitivities, and data development

We envisage a top-down approach for the development of the scenarios and sensitivities, and a bottom-up approach for the development of the data, as illustrated in Figure 2. As a first step, the EU-wide assessment would develop a few, high-level scenarios for the whole of Europe.²⁰ These would represent credible futures and determine key assumptions to be used across all MS, similar to the current practice with the MAF (e.g., fuel prices and technology costs for each scenario). The EU-wide scenarios would be agreed upon by ENTSO-E, the ROCs, and national TSOs, with oversight by ACER (and by extension NRAs).

As a next step, the ROCs would develop regionally detailed analyses with the national TSOs of a given region. These would use the EU-wide scenarios as the starting point and cover regional and national specificities in a coherent manner (e.g., modelling a low-rainfall or a cold winter-

¹⁸ This is evident in ENTSO-E's MAF, which is using five different models to estimate the risks to security of supply. For example, in the 2018 MAF report, the LOLLE for France in the Base case and year 2020 varies between 0 and 2 hours/year for model 1, and between 0 and 15 hours/year for model 3. It can be difficult to draw any safe conclusions based on these diverging results, even though sense-checking results with additional models can be a prudent exercise.

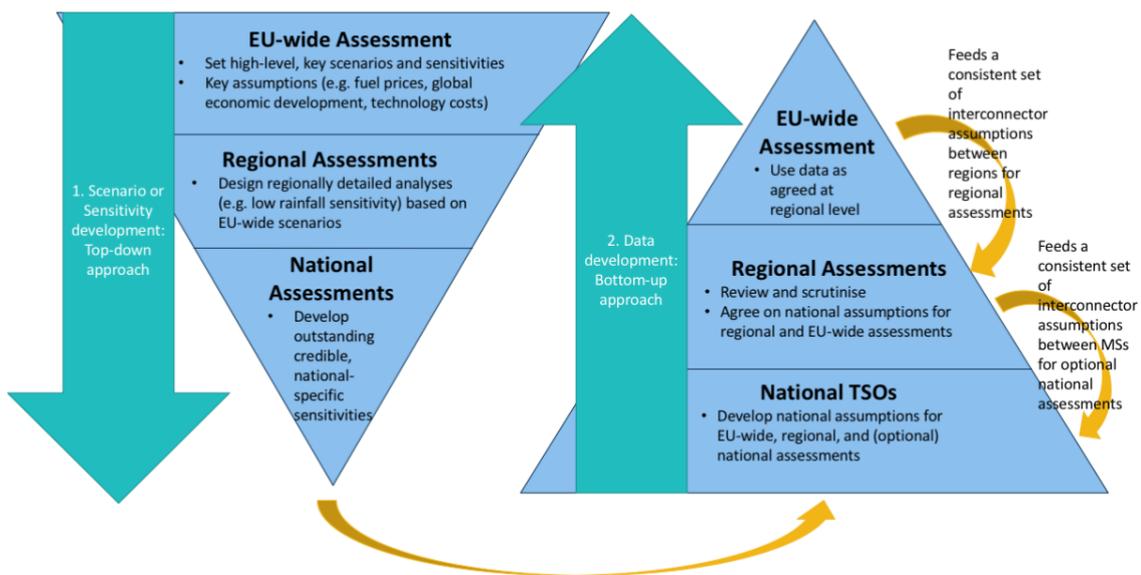
¹⁹ We envisage a European-wide modelling tool that is available across the ENTSO-E, ROCs, and national TSOs, and can zoom in and out of different areas. The building block of the model should be the European bidding zones.

²⁰ At the moment, the MAF considers one key scenario and one sensitivity, while ENTSO-E's Ten Year Network Development Plan (TYNDP) considers three scenarios for different timeframes. We would expect that ENTSO-E's EU-wide resource adequacy assessment considers three to four scenarios/sensitivities in the future.

low wind year in a region, but eliminating scenarios reflecting incompatible inputs among MS). The region's NRAs would be responsible for approval. If a MS decides to carry out a national assessment, this would consider any additional sensitivities necessary to take into account legitimate MS-specific situations (e.g., documented issues regarding plant availability).

National TSOs would be primarily responsible for the development of national data. To ensure the coherence and consistency of the scenarios and sensitivities, it is important that the input assumptions themselves are consistent across the national inputs and that any interdependencies are taken into consideration. For this reason the input assumptions to be used in the regional and EU-wide scenarios should be agreed upon within the regional structure between the national TSOs and NRAs. This strategy would have the additional benefit of enabling TSOs to share knowledge and develop their understanding of the market and the interdependencies between MS in an increasingly interconnected power system. Scrutinising and agreeing on the data within a regional structure would be a more pragmatic and productive approach than agreeing on data in an EU-wide group involving significantly more parties, many of which will have little or no stake in outcomes in regions remote from their borders.

Figure 2. Illustration of the process for the development of scenarios/sensitivities and input data



The data agreed upon at the regional level would then be used for the EU-wide and regional assessments. One of the outcomes of the EU-wide assessment would be a consistent set of interconnector contributions at times of system stress between the different regions. These outputs should be used as an input for the regional assessments to guarantee a consistent approach between regions. In addition to the regional scenarios, we suggest that the regional assessments run the EU-wide scenarios for a given region (taking into account the aforementioned interconnector contributions between regions), in order to streamline the decision-making process discussed further below.

Similarly, the regional assessments would produce a set of interconnector contributions between MS. In carrying out a national assessment, a MS should use the outputs of the higher-level assessments on interconnectors as inputs in its assessment. In this way, MS would take

into account the interconnector contribution to their SoS and eliminate any discrepancies between their assessments. This would also replace the time- and resource-consuming process by which each MS makes an assessment of its neighboring systems when establishing the contribution of interconnectors at times of system stress.

Governance

As previously explained, the ROCs would be ideally placed to coordinate the regional assessments, given their nature and scope of activities. The regional delineation for the assessments could follow established fora of regional cooperation, such as the Pentalateral Forum or the Central and South Eastern European Energy Connectivity, or the system operation regions as these will be defined following the implementation of the package. In addition, ENTSO-E would be responsible for coordinating the EU-wide assessment and national TSOs would be responsible for undertaking the optional, national assessment.

The assessment structure would require an equivalent regulatory and oversight structure to be in place. For the EU-wide and national assessments this would remain as is at present, wherein ACER (in cooperation with NRAs) and the NRAs respectively have an oversight role. For the regional assessments, the NRAs of the given region would be responsible for reviewing and approving the assessment. This would ensure closer cooperation and coordination on the regulatory side, too.

Decision-making process

The decision-making would be based primarily on the regional assessments, which would model national, regional and EU-wide scenarios and sensitivities. If the regional assessment highlights that a MS is facing a security of supply problem, then the MS would have the discretion to apply measures to alleviate these concerns within the limits of the legal framework (e.g., after first identifying the reasons for the shortfall and developing a plan to remove any market distortions). On the contrary, if the regional assessment demonstrates that a MS would meet its reliability standard, the default position would be that the MS has no need to and cannot take measures outside of the market to provide financial support to capacity resources.

If the regional TSOs and NRAs fail to agree on a set of scenarios and sensitivities or the underlying data, then an arbitration process would kick in to decide on it. The arbitrator should be a neutral and expert organisation. This role could be fulfilled by the Commission, and DG Energy in particular,²¹ or ACER.²² Alternatively, ACER could issue an opinion on the disagreement and the Commission would make the final decision.

In addition, if a MS decides to undertake a national assessment, this could also be considered in the decision-making process. Where a national assessment diverges from the regional assessment showing a potential SoS concern, and a MS would like to pursue out-of-market measures, then the national TSO should have to demonstrate what the differences are between

²¹ The Commission is a common arbitrator in similar cases, like the bidding zone process. DG Energy would be well suited to the task due to their deep understanding of the power sector.

²² ACER would also be well placed to carry out this activity, given their role in approving the EU-wide assessment and related methodology, independence from national interests, and its key objective in realising the internal electricity market.

the two assessments and why these are credible. For the benefit of transparency, this information should become available to all involved parties (e.g., ENTSO-E, ROCs) and more broadly to all market participants.

In order to ensure that all parties have confidence in the submitted evidence and the European market is not distorted by unnecessary interventions, an arbitrator with the same characteristics like the ones outlined above should have a role in scrutinising it. Following the review of the evidence submitted by a MS, the responsible body would approve or reject their case.²³

Conclusions

Security of supply is most often considered a national prerogative. However, European legislation clearly states this is an area of shared responsibility between the Energy Union and MS.²⁴ The final agreement of the Regulation of the Internal Electricity Market should ensure this becomes a reality by establishing regional resource adequacy assessments. This approach is followed in the gas sector, where MS have formed regional groups to assess the risks of disruption to gas supplies and develop joint actions to mitigate them.²⁵

Moving towards a more regional and coordinated approach to estimating the levels of SoS in MS will ensure an improved and consistent assessment of the contribution of interconnectors and enhanced scenario quality. National TSOs would continue to play a major role in the assessments through collaboration among TSOs, ENTSO-E, and the ROCs. Equivalently, a regional approach would require stronger cooperation between NRAs, which would be responsible for oversight and approving the assessments. This construct would ensure that both the national perspective and European market dimension are appropriately taken into consideration.

MS can achieve the desired level of reliability at a lower cost by the cost-efficient allocation of regional resources that would lead to a reduced need for investment in new resources. Alternatively, continuing to deal with security of supply within national borders, as proposed by the Council, could cost as much as €8bn more per year in 2030. Realising the benefits of sharing resources would require a more regional dimension to assessing resource adequacy. The good news is that every MS and its consumers would benefit from it.

²³ Currently, the Commission, and DG Competition in particular, is effectively responsible for reviewing the background analysis supporting the application for a CRM, including the resource adequacy assessment. However, the department's key expertise lies in analysing a proposed design in terms of being open to competition and equal treatment of resources.

²⁴ For example, article 194 of the Treaty on the Functioning of the European Union demonstrates that SoS is an area that falls within Union policy.

²⁵ For more information, see for example: https://ec.europa.eu/info/news/securing-europes-gas-supply-new-regulation-comes-force-2017-oct-27_en



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