

15 May 2019

Resources Adequacy Assessments in a Nutshell



15 May 2019

1 What does “Resources Adequacy” mean?

'Resource adequacy' of a power system has to be understood by reference to "**system reliability**", which means achieving both "**security**" and "**resource adequacy**" in order to avoid the collapse of the entire power system (blackout) or the collapse of one part of the power system (brownout):

- 'Security' relates to short-term issues. It is classically defined as "*the ability of the system to withstand a disturbance, large and small, due to failure of some system components.*"¹
- 'Resource adequacy' is a mid to long-term issue. It is achieved when, all resources necessary to achieve energy security - not just generation, but also demand side resources, interconnection, the transmission network etc. - are sufficiently available to meet electricity demand, at all times.

The resource adequacy assessment ("**RAA**") is conducted using probabilistic models taking into account most likely scenario of future supply and demand, current and future grid characteristics, weather impacts, etc. RAAs are technical-economic prospective studies and therefore represent a probable vision of what a power system (European, regional, national) will look like in the mid to long-term.

From an economic perspective, achieving 100% adequacy and security may lead to unreasonable costs. This means that national power systems are not designed to achieve 100% resource adequacy, due to the excessive costs.²

2 How can RAAs be used by energy campaigners?

(This section should be read together with sections 3 (current RAA rules until end of 2019) and 4 (RAA rules from 2020) below, which explain how RAAs are (and will) be produced, and more detail on how they can be used.)

- We often see arguments made by national authorities or energy companies that significant coal (or gas) capacity is needed to 'keep the lights on'. Campaigners may be able to use the results of a properly conducted RAA to demonstrate or argue that this fossil fuel capacity is in fact not needed to ensure security and adequacy of the system, if the RAA shows that closing those plants will not itself lead to any brownouts or blackouts. In the context of the energy transition debate, it is important to distinguish between blackout or brownout occurring further to a grid incident or hacking of infrastructure on the one hand

¹ For more detailed explanations see, Electricity Markets – Theories and applications, Jeremy Lin and Fernando H Magnago, Wiley, 2017 p. 25

² In order to achieve an efficient solution, different approaches and concepts are used, such as the concept of the "value of lost load" (referring to the maximum theoretical price that consumers would agree to pay in order to avoid interruption of supply) or the idea that a reasonable threshold of adequacy and security is sufficient.

15 May 2019

and a blackout or brownout occurring because the resources are not sufficient to meet the load at certain moment on the other hand.³

- We also see arguments that particular coal plants are projects of 'national importance', and so should be exempt from complying with the legal or policy rules that apply to other industrial installations or power generation facilities. Again, campaigners may be able to use RAA results to demonstrate that those installations do not actually have any special importance, and should not be exempt from complying with the usual rules.
- If national authorities are arguing that capacity payments are required to keep coal (or gas) plants open, campaigners could check the European and national RAA to see whether it shows that there are resource adequacy concerns. If not, then no capacity mechanism will be permitted under the recast Regulation on the Internal Market for Electricity ("**Electricity Regulation**").⁴ And even if there are resource adequacy concerns, campaigners should argue that, as required by the Electricity Regulation, capacity mechanisms are a 'last resort' and the government should first ensure that it has implemented any necessary market reforms to address those concerns.
- If an RAA does show adequacy concerns, campaigners should check whether the data that it is based on are appropriate. RAA may be underestimating the current or future availability of certain potential resources, because they have simply been omitted from the discussion, or maybe because they have not been thought of. This will likely require assistance from technical experts - but could be an important thing to do since, as explained below, RAAs rely on data provided by energy companies themselves - who usually will want to use data showing that there are resource adequacy concerns.
- However, even a properly conducted RAA may also reveal that adequacy concerns are grounded in fact. This would be the case if investment in other available resources such as RES, interconnectors, demand-site response and energy efficiency measures are not intensified in order to compensate for phasing-out of coal. Campaigners should argue that these should be addressed by more funding for these clean resources and not through more investment in coal or gas.

3 Current role (until end of 2019) for RAAs: limited

The current EU law rules for RAAs do not impose meaningful obligations on national authorities, and are hard to use in campaign activities. Not impossible, but not as effective as they could be. Things get better from 2020 under the Clean Energy Package - see section 4 below.

³ Anti-RES advocates may blow the former out of proportion and use them as a proof that maintaining abundant thermal generation is indispensable. See for example how a February 2019 local brownout in Berlin caused by works on a bridge resulted in comments about inadequacy of RES to provide sufficient resources <https://www.dw.com/en/berlin-blackout-raises-questions-over-germanys-power-grid/a-47730394>

⁴ We refer here to the provisional edition, current as of the date of this memo: P8_TA-PROV(2019)0227 European Parliament legislative resolution of 26 March 2019 on the proposal for a regulation of the European Parliament and of the Council on the internal market for electricity (recast) (COM(2016)0861 – C8-0492/2016 – 2016/0379(COD)), available here: http://www.europarl.europa.eu/doceo/document/TA-8-2019-0227_EN.html?redirect. See in particular Articles 20, 23-24 on RAAs, as well Article 21 on capacity mechanisms.

15 May 2019

The EU's 2009 Third Energy Package sets the rules for conducting a RAA. ENTSO-E (the EU-wide body representing national transmission system operators) has to carry out the following assessments:⁵

- A ten year network development plan ("TYNDP") - the rules around this are not 'strict', for example there is no need to take into account interconnectors, which goes against the logic of a single EU internal electricity market.
- Every two years, a European generation adequacy outlook.
- Annual summer and winter generation outlooks - this is very short term in its focus.
- An annual Mid-term Adequacy Forecast (the "MAF"). This is both an EU-wide RAA and a methodology which can be used for regional and national RAAs. The purpose of the MAF is to help stakeholders and MS make investment and policy decisions.

These assessments are all *non-binding* - they have no clear legal effect for national authorities.

4 RAAs from 2020 - an important tool for energy campaigners

The recast Electricity Regulation⁶ – part of the EU's Clean Energy for All Europeans Package – introduces a much stronger, more legally binding framework for RAAs. This could mean that energy campaigners are better able to rely on them as an important tool in their work campaigning for an energy transition.

The Electricity Regulation requires ENTSO-E to carry out a European RAA; it also sets a framework for how national assessments should be carried out. The national assessments are optional, but if they are carried out, they must now comply with specific rules set out in the Electricity Regulation.

Some of the key features of these European and national RAAs are as follows:

- The European RAA considers resource adequacy both at the Union level and at Member State level. The national RAAs must consider resource adequacy at the regional level. This means that ***adequacy can no longer be assessed purely based on looking at the power system of a single Member State.***
- National RAAs and the European RAA are now required to take into account ***interconnection between different national power systems.*** Interconnection is essential to the energy transition, as it allows variable renewable power to be transmitted between Member States, and provides access to additional resources when (for example)

⁵ See Article 8 of Regulation 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003 ("Regulation 714/2009")

⁶ See footnote 4

15 May 2019

national renewable generation sources are not providing enough capacity. Assessing resource adequacy without considering interconnection would mean underestimating, every time, the available resources. And it could lead to Member States investing in / subsidising additional unnecessary capacity - often this will be fossil fuels.

- ACER (European Agency for the Cooperation of Energy Regulators) and the Regulatory Assistance Project have separately calculated that a regional or EU-wide approach could save up to EUR 3.5 - 7 billion (ACER) or even EUR 8 billion (RAP) per year by 2030.⁷ This is a benefit that will be received by consumers.
- The Electricity Regulation also introduces important new rules for capacity mechanisms. As well as the famous '550 rule', it prevents Member States from introducing capacity mechanisms unless either the European or national RAA identifies resource adequacy concerns. Even then, the Member State must take other measures to remove that concern - and can only implement a "temporary"⁸ capacity mechanism as a "last resort"⁹ to address resource adequacy concerns. Member States should as a priority implement a plan to eliminate "*regulatory distortions or market failures*" if the national or European RAA identifies a resource adequacy concern. This means that RAAs can be a really important tool in arguing against both the existence and design of capacity mechanisms in any Member State.

One of the weaknesses of the process is that under the Electricity Regulation, the data that will be used to prepare the European and national RAAs is provided by energy companies to the national transmission system operators ("**TSOs**"), who in turn deliver them to ENTSO-E. As the energy companies have vested interests in keeping a high capacity of supply (e.g. capacity payments), there is therefore an incentive to provide data which would demonstrate resources adequacy concerns.

This means it is important to build up capacity at civil society level in order to challenge the assumptions used by ENTSO-E to prepare the European RAA. This will require national level expertise / data.

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⁷ See p. 12 of Annual report ACER / CEER on the results of monitoring the internal electricity markets in 2017 https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/MMR%202017%20-%20ELECTRICITY.pdf; and Baker, P., Hogan, M., and Kolokathis, C. (2018). Realising the benefits of European market Integration. Brussels, Belgium: The Regulatory Assistance Project, available at <https://www.raonline.org/knowledge-center/realising-the-benefits-of-european-market-integration/>.

⁸ See Article 2(22) of the Electricity Regulation

⁹ See Article 21(1) of the Electricity Regulation

15 May 2019

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