ENTSO-E proposal for VoLL, CONE and RS Methodology

A Eurelectric response paper

January 2020

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

Dépôt légal: D/2020/12.105/6

WG Wholesale Market Design & Investment Frameworks

Contact:
Gabriel de Couëssin, Advisor Retail & Wholesale markets - gdecouessin@eurelectric.org

Charlotte Renaud, Manager Markets & Customers - crenaud@eurelectric.org

ENTSO-E Proposal for VoLL, CONE and RS Methodology

A Eurelectric response paper January 2020

KEY MESSAGES/EXECUTIVE SUMMARY (optional)

- Eurelectric welcomes the opportunity to provide comments on ENTSO-E's proposal for Methodology for calculating the Value of Lost Load, the Cost of New Entry for generation, or demand response, and the Reliability Standard.
- Our key remarks and suggestions for improvements are the following:
  - **Regarding the proposed consumer segmentation, Eurelectric believes that VOLL estimates should be provided for all relevant categories of consumers (i.e. domestic consumers, tertiary sector, transport, industries).** The proposed approach to aggregating all DSR into a single category for VoLL (based on a price-elastic response) may not represent the reality of this section of the market.
  - In particular:
    - **For the VOLL for domestic and tertiary sector, the proposal to base the VoLL definition on the "willingness to accept" (WTA) is welcome.** Despite it appears at first sight contradicting with the definition of VoLL given in the Regulation 943/2019 pointing towards a "willingness to pay", we believe that the **WTA estimates are more statistically robust and more appropriate (than the WTP results) in policy terms for setting a VoLL as an input to security of supply.**
    - **For the <u>VOLL for the industry,</u> the methodology should ensure that any deviation of future economic patterns from historical economic patterns is properly taken into account.**
    - **For the VOLL for the transport sector,** the proposed methodology seems to underestimate the impact of disruption in such a strategic sector to the rest of the economy.
    - **For the single VOLL,** the estimate obtained by applying the proposed formula should be benchmarked with estimates of similar or related concepts available from local authorities.

- Eurelectric believes that the methodology should clearly **require Member States to assess on a yearly basis whether their estimate for the Cost of New Entry (CONE) needs to be revised.** Such revision (incl. the costs of new entry for all potential candidate technologies and not only merchant investments) should happen at least every five years.

- **Eurelectric has serious concerns about the proposed manner for calculating LOLE target ($LOLE_{target}$ = CoNE/VoLL).** A clear distinction should be made between a reliability standard derived from estimates of VOLL and CONE, say the "target LOLE", and the reliability standards set by Member States

8. Would you have any comments related to the part specifying the calculation of the Value of Lost Load (VoLL)?

Article 2: Definition and interpretation

- According to EMR (Art.11§1), "(…) regulatory authorities or, where a Member State has designated another competent authority for that purpose, such designated competent authorities shall determine a single estimate of the value of lost load for their territory."

  Eurelectric believes that the item "Regulatory Authority (RA)" in Art.2 should be reviewed to match the definition and the provisions contained in the EMR. Otherwise, the use of "RA" (standing for "Regulatory Authority") within the methodology is confusing. In other words, the methodology might allocate a task to "RA" while this task should not or will not necessarily be performed by the Regulatory Authority.

Article 3: Consumer segmentation

- **Eurelectric believes that VOLL estimates should be provided for all relevant categories of consumers (i.e. domestic consumers, tertiary sector, transport, industries).** In case a category of consumers is excluded from the computations of VOLL estimates, a proper justification should be provided. Eurelectric agrees that consumers offering substantial demand response (i.e. price-elastic consumers) could be excluded from these estimates for their part in price-elastic demand, but would like to emphasize that the same consumers could also have a price-inelastic demand. Indeed, adopting a too simplistic approach to aggregating all DSR into a single category for VoLL (based on a price-elastic response) may not represent the reality of this section of the market.

Article 4: VOLL parameters for adequacy issues

- **Eurelectric would like to stress the importance to characterize the duration and the existence of a pre-notification period for the adequacy issues (outages).** In practice, the energy transition to a low-carbon economy is increasing the share of intermittent renewable generation. Therefore, the "most likely period(s) of occurrence" of adequacy issues might evolve over time. In particular, they might not be linked to periods of peak electricity demand (what matters are the moments of "residual peak demand" and the associated supply actually available at these moments).

Article 5: Domestic and tertiary sectors

- **EURELECTRIC supports the proposal to base the VoLL definition on the "willingness to accept" (WTA).** Despite it appears at first sight contradicting with the definition of VoLL given in the Regulation 943/2019 pointing towards a "willingness to pay", **we believe that the WTA estimates are more statistically robust and more appropriate (than the WTP results) in policy terms for setting a VoLL as an input to security of supply.**

This vision is supported by Ofgem and DECC in their joint report from June 2013 on "The Value of Lost Load (VoLL) for Electricity in Great Britain"[1]. The report shows that:

- the *"Willingness To Accept (WTA) estimates are larger than the comparable WTP (Willingness To Pay) estimates. This is as expected. When consumers are used to enjoying a service that they pay for, they typically want a greater payment in order to bear a loss of that service than they are willing to pay to retain it. This is because individuals feel a sense of ownership for something they already have (in this case as a reliable electricity service). Psychologically, the loss from giving something up feels greater than the gain from keeping it and avoiding the loss, and thus WTA is often empirically greater than WTP".*

- *"Because of this noted 'ownership' effect, and the policy implications of it, using the WTA estimates is most appropriate in the context of valuing security of supply for electricity".* Indeed, "*the WTA indicates consumers' inconvenience value if the reliable service they already enjoy were interrupted. Consumers will typically not be willing to pay more to improve the service (i.e., avoid the outage) but when an outage occurs may feel that the involuntary disruption is worth some form of payment for the service they provide"*.

- As a consequence, their conclusion is that *"WTA results are both more statistically robust and more appropriate (than the WTP results) in policy* terms for setting a VoLL as an input to security of supply […].The rationale is that WTA corresponds better with the concept of an 'outage', which represents taking away a good that consumers already enjoy."*

- **Eurelectric would like to understand how the actual evaluation of "the amount of electricity cut off during the outage" would be performed.** Indeed, depending on the estimates of the electrical consumption used for the conversion from EUR/outage to EUR/MWh, one could obtain very different numbers for VOLL. A customer's VOLL is unlikely to be a static figure but will increase with duration and frequency. The VOLL in a single event to a domestic customers that last for an hour may be no particular hardship, but as the duration increases, or the frequency of interruption increases, then the value is likely to increase. Hence the VOLL is more a curve rather than a single figure. In addition, given the forecasted rise of energy constrained resources participating in capacity and energy markets, we can expect the relationship between time/duration of outages and VOLL to further increase. This can undermine the key assumption of the entire methodology.

- **Eurelectric would like to draw the attention on the fact that the interviewees should also understand the consequences of their answers.** Indeed, the conversion of VOLL from EUR/outage to EUR/MWh at a later stage might create inconsistencies between the actual situations reported by the interviewees and the final VOLL estimates obtained.

Article 6: VOLL for the industry

- **Eurelectric would like to stress that the proposed methodology assumes that the value of lost production is independent from the time and duration of the outage and**

[1] Ofgem/DECC report on "The Value of Lost Load (VoLL) for Electricity in Great Britain" (June 2013) – See executive summary (pages xi / xii & page xvii)

indeed the location of that production. Consequently, this assumption implies that the item "other costs (sector)" should also include an estimate of all additional costs if this assumption is not satisfied for this specific sector. These additional costs might not be limited to the list provided in the draft methodology.

- The proposed methodology should clarify that the values for both factors PNF and SF could differ from the values mentioned in this methodology, if judged necessary.

- The proposed methodology is based on historical data for "annual gross value" and "annual electricity consumption". However, the quantities concerned by this methodology (VOLL/CONE/Reliability Standards) could also be used on prospective basis, e.g. on a time horizon of at least 10 years. Indeed, it should be noted that in some Member States (and bidding zones) the TSO's are forecasting significant demand growth in electricity demand over the coming decade. In these instances, it is critical that such 'prospective' increases are actively taken into consideration in the methodology. **The methodology should ensure that any deviation of future economic patterns from historical economic patterns is properly taken into account.** Our recommendation would be to include such growth potential in an additional 'future forecast' parameter in the methodology, orin the item "other costs (sector)".

- In case the item "other costs (sector)" are estimated to be equal to 0, a proper and detailed justification should be provided by the entity in charge of the estimates. In addition, any marker player in the sector concerned should be able to challenge the assumption retained, esp. if this item "other costs (sector)" is set to 0

Article 7: VoLL for the transport sector

- **Eurelectric believes that the proposed methodology overlooks the impact of disruption in transport to the other sectors in the economy.**

  - First, we would welcome clarification on what is the "lost production" of transport.

  - Second, regarding the calculation of the value of lost time :

    - The number of passengers at each hour are obviously not equally distributed over the year – the formula for NPh might underestimate substantially the actual number of people impacted by an outage affecting transport.

    - The use of the value of 50 % of the wage rate for unemployed seems completely arbitrary.

    - Last but not least, a survey-based methodology could be preferred in order to allow a better assessment of the value of lost time

  - Third, there is an indirect cost of a disruption in transport on the other sectors – if a commuter cannot reach its job location, there exists an associated lost production in the sector. This lost production might not have been accounted yet in the estimates for the industrial sectors (see above), esp. as these "lost production" costs might not be induced at the same time. The reason why transport is not included in the tertiary sector should be further clarified.

  - Last, for security reasons, the activation of rotating load shedding plans by system operators might imply that all public transport – including public transport beyond the zone were load-shedding takes place – are affected and not operating for a given

amount of time. This would in turn have an impact on the other sectors (domestic, tertiary, industry).

Article 8: Single VOLL estimate

- **Eurelectric believes that the single VOLL estimate obtained by applying the proposed formula should also be benchmarked with estimates of similar or related concepts available from local authorities** (national central bank, state planning office).

- An important aspect missing in this draft methodology is the need to assess the uncertainty around the VOLL estimates obtained. For instance, there is a risk that the costs included in the VOLL are not-exhaustive (e.g. investment-attractivity of a country if the LoLE is 2x or 3x of a neighbour ; or the cost of investing in UPS)

- One should indeed avoid the "garbage-in garbage-out" obtained by applying blindly a sequence of formulas and of estimates.

- These are precisely some of the reasons why the final VOLL set by the Member State (or by a competent authority designated by the Member State) could differ, even substantially, from the estimates obtained by applying the proposed draft methodology.

9. Would you have any comments related to the part treating the calculation of the Cost of New Entry (CONE)?

Article 9: Overview of the calculation of the Cost of New Entry

- **Eurelectric believes that each Member State should assess every year whether their estimate of the Cost of New Entry should be reviewed**, especially since the proposed methodology implies that it could be based on several technologies (see Art.16).

- However, such an assessment does not imply that the Member State should perform a full update of the costs of new entry for all potential candidate technologies. **We believe that the requirement for this annual assessment to be carried out by Member States should be explicitly expressed in the proposed methodology,** particularly in instances where the CONE value is used as a parameter (e.g. capping bid prices in capacity auctions) that can impact participants' revenues. In addition, it is prudent that there is a list of criteria to define what event should trigger an immediate re-assessment.

- Finally, **each Member State should indeed review their estimate of the Cost of New Entry, incl. the costs of new entry for all potential candidate technologies, at least every five years**. However, it is important to highlight that it will be very difficult for a Member State to capture the decision making of individual companies. It can only be a rough approximation.

Article 10: Review and selection of candidate Reference Technologies

It is not clear how / on what basis the selection of a (candidate) Reference Technology would be made, and how consistency is ensured. As the rest of the process will be done for the selected Reference Technologies, (non-)selection is crucial.

In particular, Eurelectric wonders why the CONE should only be calculated based on merchant investments (for which decisions are "likely to be made by rational and competitive investors"). Indeed, all standard technologies that can be a potential new entry and that could contribute to adequacy should be included somehow in the candidate Reference Technologies. The CONE could take into account that certain investments/technologies beneficial from a global welfare point of view would not be built based only on market signals (e.g. given the energy transition, an asset

with some forward-looking features could be more expensive today, although more versatile over its lifetime to the changes in business context).

Furthermore, Eurelectric believes that the methodology proposing the process for review and selection of candidate Reference Technologies for the calculation of Cost of New Entry should explicitly make reference to the updated CO_2 emission limits as outlined in Article 22 of the Regulation (EU) 2019/943. This would provide certainty that the criteria for Reference Technologies are compliant with all aspects of the Regulation (EU) 2019/943 as required.

Article 11: Define the detailed technical characteristics of the selected reference technologies

There is merit in providing a degree of flexibility regarding the limiting of the BNE to a specific location.

As an example, noting the uniqueness of the all-island SEM, there is an argument that the calculation of a BNE should be constructed on a non-site-specific basis, to reflect a positive signal for entry, all-island, based on the actual network constraints at any given time. There was the assumption put out in the last BNE 2018 by the Regulatory Authorities, that location was based on new entry only siting where old generation had exited. This does not provide a fair signal for all new entry and will also became an issue when it comes to defining the BNE reference technology on the lines of potential new entry—because this could include offshore (unlikely of course, but still) and CCS—both of which may have very specific locations which are then not signaled or provided for within the headroom allocated through the calculation of VOLL and BNE Net CONE.

Article 12: De-rated capacity

Eurelectric would like to emphasize that there is no definition of "Stress Events" – in practice, beyond a definition, the important point is to better characterize these events, esp. in terms of duration.

As a side comment, one should note that electricity prices are not necessarily the right metric for identifying stress events in a given zone, esp. if the price spikes are due to algorithmic issues.

Article 13: Construction period and Economic Lifetime

Eurelectric is not convinced that economic lifetime and payback period should be equal, and this assumption should not be made here for all technologies. This is an assumption that is taken for computation purposes and ideally we should further define the economic lifetime and payback period of each technology.

Article 14: Development of bottom-up estimates of Capital Costs and Annual Fixed Costs for each candidate Reference Technology

For some technologies connected at distribution level, one should not restrict the electricity network costs to the electricity transmission charges, but also consider electricity distribution charges.

In addition, where security of supply policy imposes a requirement for dual fueling, these additional cost must be captured in the Capex calculation, similar line-items arising from back-up fuel stock holdings, market collateral requirements, etc must also be included in building up the Capital and Annual Fixed Costs figure.

The data used for estimating the capital costs and the annual fixed costs should be made publicly available by the Member States and be subject to a public consultation before being used in any methodology. This is the only way to ensure transparent, reliable and verifiable figures.

Article 15: Determine an appropriate Cost of Capital

- **The data used for estimating the WACC should be made publicly available by the Member States, or cross jurisdictional bidding zone, and be subject to a public consultation** before being used in any methodology. This is the only way to ensure transparent, reliable and verifiable figures.

- **There should be separate methodology for establishing risk free rate for (at least) the Eurozone and out-of-Eurozone countries, for the purposes of calculating WACC.** In practice, WACC calculation should also account for: (a) risks inherent for assets' main sources of net cash flow, e.g. generation asset based on FiT/FiP/CfD for renewables or capacity remunerations are much more predicable (less risky to the investor) then a merchant power plant (b) technology specific risks stemming from both national and European regulatory framework.

Article 16: Compute the Equivalent Annualized Costs and determine the CONE

The proposed methodology is defining somehow the final CONE as the CONE of the last technology that could bridge a capacity gap, i.e. a "marginal" CONE.

This approach is questionable for the following reasons:

- **The final CONE depends on the identified capacity gap, irrespective of the actual business cases of the different technologies**. In other words, the final CONE could assume that some "infra-marginal" (in this specific reasoning) technologies will develop even if the investors doubt about their business cases under some market design or if the development constraints prove to be stricter than expected.

- **One should also keep in mind that the variable costs and the fixed and investment costs are usually negatively correlated.** Technology with low fixed and investment costs could have very high activation/variable costs. This could lead to substantial total costs once both the variable costs and the fixed and investments costs are factored in. The proposed methodology could therefore yield a final CONE that impacts considerably the level of the short-term energy markets.

Like any estimates, the CONEs of candidate Reference Technologies are subject to uncertainties, as inter alia, there may be a difference between "Economic Life" (which can be many things) and the term over which financing can be secured for a given technology. To reflect reality, the term should reflect what a typical merchant plant, using the reference technology, can finance. These uncertainties should be properly reflected when using these CONEs, the applicable WACC(s), as well as the final CONE.

10. Would you have any comments related to the part treating the calculation of the Reliability Standard?

Article 17: Main Reliability Standard based on Loss of Load Expectation

- **We would like to express a serious concern about the proposed manner for calculating LOLE target ($LOLE_{target}$ = CoNE/VoLL),** as in our opinion this approach is not applicable for seeing the very specific codependences we are seeking to capture in resource adequacy study, namely:

    a. **This approach does not capture the actual economic effect resulting from market failure in the event of blackout.** It allows for scenarios where reserves are close to zero, thus balancing on the edge of not only not delivering (for example) missing 100 MW capacity, but also triggering a complete blackout for the whole system.

This event can result in follow-on effects for the interconnected systems, which means not delivering any capacity (in zone?, country?, EU?) for multiple hours that it takes to restore the power system and economy to normal state.

b. **The proposed approach does not capture the effect of increased risk of network-related overloads,** due to stresses caused by local capacity imbalances in the system. In essence, having almost-zero reserves in ERAA would lead to a conclusion that every generation asset in the system can be perfectly dispatched and perfectly contribute to achieving network stability. In practice, physical reality of the meshed system means the network constraints are bound to occur, and if they happen to occur unexpectedly in times of almost-zero capacity reserves, they are also bound to cause curtailments in electricity supplies to the consumers (sometimes, those can be widespread, as recently seen in Argentina). ERAA methodology should account for the fact that economically optimal electricity network is not a copper plate.

c. **The current approach does not take into account the effect of emerging elasticity of demand**, further referred to as DSR. As DSR offers start to appear on the market (be it energy or capacity market), it is prudent to assume that the most cost-efficient DSR resources emerge first. However, this also means that (market-averaging) VoLL measure is no longer valid – since the costs-effective DSR is already directly present on the market, non-delivery to other customers is bound to have economic consequences with higher-than-average costs.

d. **The proposed approach seems to be poorly suited for the more interconnected and digitalized economies of the future.** When facing a brownout (or a blackout) there are collateral effects, i.e. consequences felt and seen not only for a limited time duration of the event, but also for many hours later as the wide range of interconnected vessels of the economy are affected. Restoring the power system is only the first step in restoring the functioning of economy, which may take multiple hours or even days to get fully on track. The abovementioned effect is apparent in any real-world situation, e.g. UK brownout of 2019 or Polish brownout of 2015. The simple CoNE /VoLL falls vastly short of capturing actual economic consequences of insufficient reserves.

e. **This approach does not reflect the procedure that will be actually performed by TSOs for load shedding**. Indeed, TSOs will most likely not be able to immediately adapt their load shedding. Therefore, there could be higher volumes of Energy Non Served (ENS) that what such approach would suggest.

- **EURELECTRIC believes that a clear distinction should be made between a reliability standard derived from estimates of VOLL and CONE, say the "target LOLE", and the reliability standards set by Member States.** Indeed, Article 25 of Electricity Regulation requires that the reliability standard is "based on the methodology", thus explicitly acknowledging that the definition of reliability standards remain part of the energy policy toolbox of Member States. Member States should therefore retain its ability to include other considerations when defining -within reasonable limits compared to the outcome of this methodology – the eventual Adequacy Standard. This is further emphasized in Article 24 of the Regulation (EU) 2019/943 which provides for a regional scope in relation to a National resource adequacy assessment, it is important that this is reflected in the final methodology.

- The reference to the "social perspective" in Art.17§3 should be clarified

Article 18: Conditions of Validity of the Reliability Standard definition:

- EMR is not only about economically justified reliability targets, but also about the ability of Member States to define their own energy policy and target reliability standards (see above).

- The assumptions in Art.18§3 are not standing in the European electricity system during and after the energy transition:

    - Indeed, demand response and storage are expected to be key elements to ensure an economically efficient integration of intermittent RES generation. Both kind of capacities are affected by substantial energy constraints and the duration of stress events could become higher than the one that could be handled by energy constrainted resources;

    - The marginal cost of new entry is not only about fixed and investment costs, but also about the impact of its variable costs on the energy markets. This should be properly taken into account.

    - With the development of the internal electricity market and the provisions set in the Clean Energy Package, countries should be expected to be more and more interconnected. Therefore LOLE and EENS are also impacted by the situation in neighbouring countries, which is exactly the reason why resource adequacy assessments should be performed at European or at least regional levels.

Eurelectric would like to stress that Appendix 1 does not provide a satisfactory answer to the challenges explained above.

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

Union of the Electricity Industry - Eurelectric aisbl
Boulevard de l'Impératrice, 66 – bte 2 - 1000 Brussels, Belgium
Tel: + 32 2 515 10 00 - VAT: BE 0462 679 112 • www.eurelectric.org
EU Transparency Register number: 4271427696-87