

# All-Island Resource Adequacy Assessment

Methodology for Ireland, Northern Ireland and All-Island Single Electricity Market

Consultation Summary



# 1. Introduction

EirGrid and SONI, as the Transmission System Operators (TSO) for Ireland and Northern Ireland respectively, have a responsibility to operate the electricity transmission system every minute of every day, whilst also planning the future of the transmission grids in their relevant jurisdictions.

EirGrid, the TSO in Ireland, is required to publish forecast information about the power system, as set out in Section 38 of the Electricity Regulation Act 1999<sup>1</sup> and Part 10 of S.I. No. 60 of 2005 European Communities (Internal Market in Electricity) Regulations<sup>2</sup>.

SONI, the TSO in Northern Ireland, is required to produce an annual Generation Capacity Statement (GCS), in accordance with Condition 35 of the Licence<sup>3</sup> to participate in the Transmission of Electricity granted to SONI by the Department for the Economy (DfE). Condition 35 also states that the statement shall be based on methodologies approved by the Utility Regulator for Northern Ireland.

Under these reporting requirements, EirGrid and SONI forecast the projected level of electricity demand and the expected resources available to supply this demand. The demand and generation forecasts for Ireland and Northern Ireland are modelled along with relevant operational requirements to evaluate power system reliability in reference to the relevant reliability standard. This process is referred to as a resource adequacy assessment where the reliability standard is specified on a jurisdictional basis for Ireland and Northern Ireland using Loss of Load Expectation (LOLE).

As European policy direction and regulations have evolved, the approach for assessing resource adequacy has also evolved to appropriately represent the transforming power system i.e. transitioning away from aging fossil fuelled conventional generation plant and towards a power system increasingly dependent on variable renewables, interconnection, demand side response, long duration energy storage and other renewable gas ready dispatch power plants. Through the Shaping Our Electricity Future Roadmap<sup>4</sup>, EirGrid and SONI identify the need to enhance our reliability assessments to suitably dimension the possible risks to resource adequacy and align with European Union regulation.

## 1.1. Consultation

From 4<sup>th</sup> December 2023 to 26<sup>th</sup> January 2024, EirGrid and SONI consulted on a new methodology focused on the modelling of resource adequacy for Ireland and Northern Ireland. The purpose of the consultation was to detail a methodology to evolve the existing Generation Capacity Statement (GCS) methodology, align with EU Regulation 2019/943 Article 24(1) and to improve the overall approach to assessing the reliability of the evolving power system.

The consultation process consisted of a webinar and paper for stakeholders to provide input. The consultation itself received 11 responses, and EirGrid and SONI would like to thank our stakeholders for their time in responding to the consultation.

This consultation summary provides an overview of the responses received for the consultation, along with a comment from EirGrid and SONI on how the feedback has been considered or will be considered in future.

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<sup>1</sup> <https://www.irishstatutebook.ie/eli/1999/act/23/section/38/enacted/en/html>

<sup>2</sup> <https://www.irishstatutebook.ie/eli/2005/si/60/made/en/print#partx-article28>

<sup>3</sup> <https://www.uregni.gov.uk/files/uregni/media-files/SONI%20TSO%20Consolidated%20Feb%202019.pdf>

<sup>4</sup> [https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping-Our-Electricity-Future-Roadmap\\_Version-1.1\\_07.23.pdf](https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping-Our-Electricity-Future-Roadmap_Version-1.1_07.23.pdf)

Q1. Do you have any comments on the factors considered in forecasting the Total Electricity Requirement (TER)?

Theme	Feedback	EirGrid/SONI Response
Tool suitability	One response we received raised a concern that a new tool is being used in this methodology and that it may be more suited to mainland Europe on not the Island of Ireland.	ENTSO-E's Demand Forecasting Tool (DFT) has allowed EirGrid and SONI to incorporate greater levels of details into the demand forecast, along with ensuring we align to European adequacy study standards. Although new, there have been extensive efforts made in ensuring the tool is fit for purpose. This has resulted in better performance of the tool and its functionalities, as well as our participation in working groups to improve the tool for future applications. Coupling this with our ability to input country specific data to the tool means we are confident it is suitable for all island studies.

Q2. Do you have any comments on the approach to modelling demand and flexibility?

Theme	Feedback	EirGrid/SONI Response
<b>Tool suitability</b>	One respondent recommended to us to compare the new tool against our own to gain confidence prior to wider use of the tool.	The existing demand forecast methodology has been maintained to form key inputs to the DFT, the DFT is used to develop hourly profiles. The tool's functionality allows us to adjust key parameters specific to Ireland and Northern Ireland. The suitability of the tool will be evaluated for each iteration.
<b>Efficiency and demand flexibility</b>	One respondent recommended not to use aggressive efficiencies or demand flexibility levels.	<p>This is relevant to the Inputs and assumptions consultation which was run separately to the methodology consultation.</p> <p>The EU Energy Efficiency Directive<sup>5</sup> is key target for reducing energy consumption in Ireland and while it is ambitious it is appropriate that consideration for future efficiency gains beyond current trends are incorporated into the model.</p> <p>Demand flexibility, achieved through smart EV charging and smart meters, adopts the best available data from reports published by ENTSOE (TYNDP Scenario Building<sup>6</sup>) and CRU Smart Meter trial<sup>7</sup>.</p>
<b>Input data</b>	We had a recommendation to share input data prior to modelling for industry to review it.	The Inputs & Assumptions consultation seeks input from stakeholders to inform inputs for the modelling process. Input data and assumptions cannot be considered final until regulatory approval of the final report has been received. Therefore, the final modelling inputs will be published alongside the final report.

<sup>5</sup> [https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive\\_en](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en)

<sup>6</sup> [https://2022.entsoe-tyndp-scenarios.eu/wp-content/uploads/2022/04/TYNDP\\_2022\\_Scenario\\_Building\\_Guidelines\\_Version\\_April\\_2022.pdf](https://2022.entsoe-tyndp-scenarios.eu/wp-content/uploads/2022/04/TYNDP_2022_Scenario_Building_Guidelines_Version_April_2022.pdf)

<sup>7</sup> <https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU1818164-Smart-Meter-Upgrade-Standard-Smart-Tariff-Decision-Paper-.pdf>

Q3. Can you identify any resources that could be considered under this methodology which are not listed above?

Theme	Feedback	EirGrid/SONI Response
<b>Modelling more markets</b>	Some respondents made recommendations to consider modelling more markets to increase the accuracy of the results.	This methodology explicitly models Great Britain and France and utilises the European Resource Adequacy Assessment to inform assumptions for neighbouring regions. Whilst modelling additional markets may provide benefits it would also introduce additional complexity. The TSOs believe this methodology strikes an appropriate balance between model complexity and accuracy.
<b>Economics of plant</b>	We had a recommendation to consider that emission targets may mean that gas fired generation could have very low load factors due to high wind penetration and emission targets. The recommendation suggested that the economics of plants need to be considered.	This will be considered as part of future work development under the Economic Viability Assessment workstream. This process is implemented as part of the European Resource Adequacy Assessment and will be incorporated into national assessments in future iterations.

Q4. Do you agree with the proposed approach to modelling the resources listed above?

Theme	Feedback	EirGrid/SONI Response
<b>Analysis complexity</b>	We had a recommendation to increase the complexity of the analysis for example to consider including System Non-Synchronous Penetration (SNSP).	The inclusion of additional constraints increases complexity of the model. Constraints such as inertia, SNSP and must run rules do not affect the availability of generators and therefore do not impact resource adequacy. As such, these constraints can be excluded from the model to reduce complexity without negatively impacting results.
<b>Outage statistics</b>	We had a recommendation regarding new gas fired generation. The recommendation was to consider using current data of similar units from other TSOs instead of using historic data.	At this time to maintain alignment with capacity market processes the outage statistics are based on performance of plant in the Single Electricity Market (SEM) only.
<b>Interconnector availability</b>	We had a recommendation to consider the importance of interconnector availability in the event of crisis where the local security of supply may take precedence over the trade via interconnectors.	This is captured in the current approach to modelling interconnection, a post modelling check has been done to analyse interconnectors are contributing to security of supply in the SEM and not exacerbating issues e.g. exporting.
<b>Interconnector availability</b>	We had a recommendation to consider times where low renewable generation availability occurs over the wider area and interconnector contribution may not be as high as required.	The methodology models 35 climatic years, with correlated conditions across Great Britain and France therefore capturing periods of coincidental low renewable availability across regions and as such reflects times where imports may not be fully available.
<b>Interconnector availability</b>	We received a recommendation to model loss factors for interconnectors as this is important when interconnector dispatch is scheduled.	This is captured in the methodology through the implementation of wheeling charges to reflect the typical order in which interconnectors may be utilised.

Theme	Feedback	EirGrid/SONI Response
<p><b>Renewable capacity forecast</b></p>	<p>We had a query asking how we devise our renewable capacity forecast in Northern Ireland given the absence of a support mechanism for renewable development.</p>	<p>The details regarding renewable forecast data are captured in the Inputs &amp; Assumptions part of the Resource Adequacy Assessment.</p>

Q5. Can you identify any additional indicators that may support communicating resource adequacy results?

Theme	Feedback	EirGrid/SONI Response
Weather effect	We received a couple of requests to present the range of climatic year results to show the effect of weather on system adequacy.	We have considered this and included a figure which illustrates the effect of climate on outturn reliability.
Hourly capacity surplus / deficit	We received a request to publish hourly Capacity Surplus / Deficit during a stressed week and for each climatic year.	Scarcity analysis (hourly / weekly / annual) is within the scope of future work.
System services	We received a request to model the need of system services.	This would be out of scope of the assessment. The aim of the report is to assess the adequacy and not the need for system services. Our ongoing work on Future Arrangements for System Services and European level work on Flexibility Needs Assessment Methodology will assess our long-term needs for most system services.



*Q6. Do you agree with the approach to modelling resource adequacy implementing stochastic assessments using a techno-economic model?*

<b>Theme</b>	<b>Feedback</b>	<b>EirGrid/SONI Response</b>
<b>Methodology comparison</b>	We received multiple recommendations to assess the current methodology against previous methodology.	We have acknowledged this request through the inclusion of appendix comparing results against the previous methodology.
<b>Reliability standard</b>	We received a comment where a respondent stated that it is not clear how the reliability standard is set.	In Ireland, the LOLE standard is set by the Department of the Environment, Climate and Communications (DECC) working with the CRU, and in Northern Ireland is set by the Department for the Economy (DfE).
<b>Economic dispatch</b>	We received a query why economic dispatch is being modelled as priority should be to ensure adequacy.	We incorporate economic dispatch to reflect the expected flows across interconnectors and utilisation of storage. Further to this, the economic dispatch will be required to assess the economic viability of generation in future assessments.
<b>Outage statistics</b>	We received a recommendation to review the analysis of our outages in the assessment. Recommendation is to consider a more probabilistic approach to outage patterns and durations. For example, Resource Adequacy Assessment currently uses an average outage duration. The recommendation indicates that using a probabilistic approach may be more suitable as some outages may take less or more time than the average.	Historical performance is used to determine outage rates, and the existing methodology does allow for probabilistic modelling of outages. A fixed forced outage duration has been chosen for this methodology, this is in line with the European Resource Adequacy Assessment methodology, the duration is consulted on in the Inputs & Assumptions consultation. The approach is reviewed each year, and this recommendation will be considered for future development.

*Q7. Are there any considerations beyond those listed above that you would like to see considered in future adequacy assessments?*

<b>Theme</b>	<b>Feedback</b>	<b>EirGrid/SONI Response</b>
<b>Neighbouring countries</b>	We received a recommendation to consider resource adequacy of neighbouring countries with a view to ensure there is no conflicting assumptions. For example, we may assume we can import electricity from the neighbouring country when they assume they can import the electricity from us.	This is accounted for in our model through modelling neighbouring regions with interconnection to the SEM. Furthermore, uncertainty relating to the availability of imports for security of supply has been investigated across a range of scenarios.
<b>Local effects</b>	We had several recommendations where local networks should be modelled, as local effects may cause adequacy issues for the system.	Modelling of the network adds significant complexity and therefore is currently outside of the scope of this process. However, the methodology does provide for an adjustment to account for localised network issues.
<b>Rare weather events</b>	A recommendation was made to consider rare weather events and their effect on adequacy.	The methodology models the effect of climate variability and presents adequacy result for the full range of climate years modelled.
<b>Data freeze</b>	A stakeholder asked us whether the data freeze timing will align with the data freeze for ERAA.	The data collection phases are not synchronised. The ERAA data collection uses the latest data available from public studies. For example, this ERAA 2023 inputs are based on data from GCS23. TSOs provide comments on the impact of differences through the ERAA country comments process.
<b>Wheeling charges</b>	We received a couple of comments regarding wheeling charges on interconnectors and their use.	Wheeling charges are implemented to prevent loop flows, and also to reflect the typical order of interconnector utilisation. This parameter has been added to the methodology accordingly.
<b>Flexibility time domain</b>	There was a request to explain the flexibility time domain whether it's daily or weekly.	Flexibility of demand is within a day; however, flexibility of battery storage is over 3 days to provide greater opportunity for storage optimisation.

Theme	Feedback	EirGrid/SONI Response
<p><b>Economic Viability Assessment (EVA)</b></p>	<p>We had a response which stated that when EVA is carried out some of the results may be out of scope of the Resource Adequacy Assessment. For example, one comment was ‘This should not include economic solutions or recommendations from the TSO as to what the correct mix should be.’</p>	<p>Consideration of the economic viability of generation is required under EU Regulation 2019/943<sup>8</sup> Article 24(1). The methodology for this assessment will be consulted on and industry will have an opportunity to provide input into the process.</p>

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<sup>8</sup> [REGULATION \(EU\) 2019/ 943 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL - of 5 June 2019 - on the internal market for electricity](#)