Dispatch Down Draft Action Plan

Northern Ireland Dispatch Down Contributing Factors and Mitigation Recommendations

System Operator for Northern Ireland

December 2024

Foreword

1.0 Introduction

This Draft Action Plan provides policy-makers, regulators, and industry, with a series of recommendations that are currently under review by SONI (System Operator for Northern Ireland), Northern Ireland's electricity Transmission System Operator (TSO), to mitigate the current levels of dispatch down of renewables in Northern Ireland.

At SONI, we are committed to supporting the delivery of the necessary, new, low-carbon, and efficient generation capacity, as well as complimentary technologies, that will enable Northern Ireland's energy transition.

The delivery of the appropriate type of new renewable generation, in the right location, is vital for a more sustainable power system that can support the Department for the Economy's Energy Strategy, and the overarching targets for emission reduction set by the Climate Change Act (2022).

As the electricity Transmission System Operator, it is vital that we continue to operate Northern Ireland's power system, safely, securely, and reliably to ensure power can flow from where it is generated to where it is needed.

At present, SONI has a dual legal obligation to ensure the development and maintenance of an efficient, co-ordinated, and economical system of electricity transmission, which has the long-term ability to meet reasonable demands for the transmission of electricity, while also contributing to security of supply through adequate transmission capacity and system reliability.

In fulfilling our obligations, SONI is required to balance a range of factors, which can often overlap and, at times, compete. These factors loosely fall into the following categories: security of supply and system stability; pace/scale of renewables integration; cost to the consumer; and timescale (as set by government policy).

As Northern Ireland's Transmission System Operator, we want to reiterate our commitment to doing everything we can to support Northern Ireland's renewable energy ambitions, within the confines of our licence, the wider policy and regulatory landscape, and within the requirements to maintain the stability of the electricity system.

2.0 Recent levels of dispatch down of renewables: Context

We acknowledge the renewables industry's significant concerns in relation to the high levels of dispatch down of renewables.

In response, SONI immediately stood up an internal Dispatch Down Working Group to address the issue. We welcome the good engagement with the renewables industry, government and regulators at the various workshops that have been hosted to date.

This Draft Action Plan is the initial culmination of this programme of work.

It sets out our commitment to working together to further understand and, where possible, deliver what mitigation solutions are available in the short-term, while the wider challenges beyond our control as the System Operator, such as the successful commissioning of the second North-South Interconnector and the market dictated flow of imports, are considered.

3.0 Existing policy and regulatory landscape

In considering this challenge and the potential mitigation solutions directly available to SONI as the Transmission System Operator, it is important to understand the existing policy and regulatory landscape which ultimately governs and dictates the Scheduling and Dispatch process.

The Single Electricity Market (SEM) is the wholesale electricity market for the island of Ireland. First going live on 1 November 2007, the market trades wholesale electricity in Ireland and Northern Ireland on an All-Island basis.

The market is jointly regulated by the Utility Regulator and the Commission for Regulation of Utilities. The decision-making body which governs the market is the SEM Committee (SEMC).[1]

The principles of the design are regulated by the Clean Energy Package and covered under international law through the UK-EU Trade and Cooperation Agreement. The Market spans several horizons including: the long-term Capacity Market, Day-Ahead markets, Intra-Day markets, and the balancing market. SONI, as a TSO, plays a significant role in the balancing market time horizon which ensures the minute-by-minute balancing of supply and demand.

SONI and EirGrid jointly schedule and dispatch the Single Electricity Market (SEM) in line with the Balancing Market Principles Statement[2]. The Balancing Market Principles are kept under review on an annual basis, with the latest version 8.0, available on the SONI website.[3]

The prioritisation of the Scheduling and Dispatch process are in the following order:

1. Ensuring operational security;
2. Maximising priority dispatch generation; and
3. Efficient operation of the SEM.

SONI's obligations to provide priority dispatch to certain classes of generators are reflected in our Licences, Grid Codes, and both national and EU legislation, forming a key part of the scheduling and dispatch process. In Northern Ireland, the priority dispatch provisions of the RES Directive were transposed into law in Northern Ireland through, among other things, a new condition in SONI's TSO Licence (Condition 9A).

The Balancing Market Principles Statement (BMPS) is prepared by SONI and EirGrid in accordance with their respective Transmission System Operator Licence obligations (Condition 22B of SONI's TSO licence, Condition 10B of EirGrid's TSO licence) and SEM Committee decision SEM-16-058 dated 7 October 2016 entitled 'Balancing Market Principles Statement Terms of Reference'.

This BMPS refers to national and EU legislation, and statutory licences, in effect and applicable to EirGrid and SONI as of April 2024. The applicable licences and codes are as follows: EirGrid Transmission System Operator Licence 10 March 2017; SONI Transmission System Operator Licence 18 November 2022; EirGrid Grid Code Version 13, 30 January 2024; SONI Grid Code 98 December 2023; and the Trading and Settlement Code Part B Version 28.0, 18 August 2023.

The TSOs review the BMPS on an ongoing basis to ensure that the BMPS continues to be accurate and up to date. The Balancing Market Principles Statement sets out in a clear and comprehensive manner how SONI and EirGrid fulfil the statutory obligations that govern the scheduling and dispatch process in the Single Electricity Market.

The requirement to provide transparency is an overarching obligation. We support transparency throughout the design of our processes and tools which are used to integrate the maximum amount of renewable energy to the NI grid that is technically feasible.

4.0 Our current work to transform the power system

SONI is committed to working with government and all stakeholders across the energy system to enable Northern Ireland's renewable energy ambitions. It is important to acknowledge the relatively new, but very significant shift, in policy ambition in this respect. It is also important to acknowledge

[1] SEM | The Single Electricity Market Committee (semcommittee.com)
[2] https://www.soni.ltd.uk/media/documents/EirGrid-and-SONI-Balancing-Market-Principles-Statement-V8.0.pdf
[3] https://cms.soni.ltd.uk/sites/default/files/media/documents/EirGrid-and-SONI-Balancing-Market-Principles-Statement-V8.0.pdf

that the transformation of the power system required to support these ambitions is unprecedented in its scale, pace and level of complexity.

In December 2022, SONI published, jointly with EirGrid, the first Operational Policy Roadmap 2023 – 2030, providing a clear pathway for transforming operational practices, that will enable higher level of renewable integration to meet Northern Ireland's renewable energy ambitions. This will enable the power system to operate a variable renewable penetration level of 95% SNSP at any point in time.

SONI and EirGrid's operational roadmap provides a clear pathway for management of transforming operational practices that will enable higher level of renewable integration to meet government ambition for 80% and enabling the power system to operate a variable renewable penetration level of 95% SNSP at any point in time.

Our Operational Policy Roadmap provides a clear pathway to ensuring that the two TSOs within the SEM can continue to operate the power systems safely, securely, and economically, at higher levels of renewable penetration. It also ensures this can be achieve whilst ensuring operational security and dynamic stability, within the appropriate margins, to ensure sufficient operational reserves and ramping capability are available to manage operational uncertainty from minutes to hours.

We are committed to reviewing the Operational Policy Roadmap with an update due to be published in early 2025. We are committed to updating our roadmap to reflect our collective accomplishments; what supporting actions are still required to get us to 95% SNSP. With respect to the passage of time we need to consider how EU, national, and company policies have evolved and how they may impact the prioritisation of actions outlined in our roadmap. Furthermore, we need to consider how new targets and initiatives can be introduced looking forward to operational policy to 2035.

5.0 Our assessment of the contributing factors to existing dispatch down levels

As part of this urgent programme of work, SONI's internal dispatch down working group sought to undertake further detailed assessments as to the root causes of the existing levels of dispatch down.

As Northern Ireland's electricity Transmission System Operator, we are required to balance a wide range of considerations when delivering on our obligations. Our obligations require us to develop the grid in an efficient, coordinated and economic fashion while maintaining security of supply at the least possible cost to consumers.

Dispatch down of renewable electricity is a complex issue, and it is influenced by a range of factors, prevailing market forces and operational challenges as we endeavour to maximise the use of non-synchronous renewables into our power system and grid infrastructure.

The principles behind the common electricity market are to ensure downward pressure on electricity prices while also ensuring delivery of climate ambitions at a European and National Level. Electricity markets in recent years have experienced a range of volatility initially during COVID where demand was suppressed leading to low prices across Europe, followed by the Ukraine War and high energy prices for Natural Gas which are beginning to subside.

However, within EU we are now starting to observe the effects of negative pricing, which is a consequence of low flexibility across Europe. For example, in the Netherlands there is high penetration of Solar PV, France's nuclear fleet has been highly available, and Scandinavia's hydro reservoir levels are low. The prices across Europe have recently been significantly lower than GB and SEM resulting in dominant flows into SEM. This has resulted in lower power prices in SEM which has led to TSO balancing actions (applied in accordance with the BMPS) that result in dispatch down of renewables in the real-time physical dispatch periods.

Operational policies impact dispatch down of generation and they are published weekly on the SEMO website. TSOs require Operational Policies to ensure power system dynamic stability, to meet reserve and ramping requirements, and to maintain operational security. Operational Policies are defined and modified through various licence obligations on the TSO.

Within the prioritisation of the Scheduling and Dispatch, ensuring operational security is paramount. To ensure dynamic stability the TSO takes action to reduce the flows on the North-South tie-line; this limits the amount of power that can flow from Northern Ireland to Ireland.

The balancing action that SONI's control engineers can take are based on the ruleset specified within the balancing market principles statement (BMPS). This means that under a high wind condition, the engineer must first accept interconnector physical flows (under current market condition typically importing at 450 MW). They must ensure there is a minimum number of large conventional units dispatched at their minimum stable level to secure the system frequency and then dispatch down controllable renewables to a level that ensures there is a secure flow of power between Ireland and Northern Ireland, so that if there was a trip of the tie-line circuit both systems would be secure.

6.0 Our Dispatch Down Action Plan

Following a period of analysis and studies, SONI's internal Dispatch Down Working Group has identified a number of areas that are currently under exploration with a particular focus on interim solutions and longer-term solutions that are aligned with our long-term Operational Roadmap.

The Action Plans are included below.

7.0 Conclusion

The recommendations outlined in this paper are the considered views of SONI and we appreciate that responsibility for the design of the market is the legal responsibility of the SEMC and Utility Regulator. It is also important to note that operational policy and procedure changes may require consultation, licence modifications, or Utility Regulator approval before action can be taken.

However, in line with our commitment to industry, we have sought to explore all mitigations options directly within our control and provide clarity on additional measures that would require action from others or policy/regulatory change.

In developing the measures outlined in this paper, SONI has engaged with a wide range of stakeholders including Department for the Economy, the Utility Regulator, Renewables NI, Mutual Energy and a range of industry organisations.

Since the commencement of this project, the team in SONI has been at all times cognisant of the challenges presented by the high levels of dispatch down to industry, to the power system and to the wider energy landscape in Northern Ireland.

We have specifically reviewed of each measure based on a number of criterion, including merits of deliverability, delivery timelines and impact to address the current levels of dispatch down.

The below Action Plan also sets out areas where policy changes or future investment could be made to address the dispatch down challenges. SONI is cognisant that there are options that need to be considered in the short-term and longer-term.

In summary, there are several strands to the programme of activities:

Strand 1: Assess short-term measures to bring clarity on Go / No-Go decisions; this will dimension how long it will be before levels of dispatch down can be minimised should current levels of market import persist.

Strand 2: Market Mechanisms which support investment into power system flexibilities or network services that can manage curtailment and constraint levels.

Strand 3: Enhancing and ensuring delivery of network assets including dynamic line rating, overhead lines and new technologies such as LCIS.

Strand 4: Further measures that developers can do such as minimising their min-gen or removal of grid code derogations that reduce system flexibility.

As it stands, until interim measures or long-term solutions are delivered, it is important to highlight:

- Our control engineers continue to schedule and dispatch generation according to Balancing Market Principles Statement;
- Imports into the SEM are beneficial in the suppression of wholesale electricity prices;
- SONI jointly with EirGrid have an Operational Policy Roadmap to support a power system capable of 80% Renewable Electricity on an annual basis; and
- SONI is committed to actively doing are part in accelerating delivery of infrastructure to support the delivery of renewable energy complimentary to DfE's Energy Strategy and the renewable electricity targets as laid out in the Climate Change Act NI (2022).

SONI will seek to ensure effective stakeholder engagement, clear communication of deliverables and further engagement on actions relevant to other partners.

Furthermore, it is important to understand the interaction of demand in the context of dispatch down, in particular the drivers to increase NI demand that fall outside of SONI's direct control. For example, the delivery of electrification of heat and transport and the opportunities for large flexible demand in the west of Northern Ireland should be considered as policy opportunities.

While we understand the recommendations outlined within this Draft Action Plan that SONI can deliver directly will not fully resolve the existing challenges, we hope it demonstrates that we have listened to and responded to industry concerns and explored all measures available to us within the current policy and regulatory landscape.

We would like to take this opportunity to thank those stakeholders who have taken the time to engage with us on this important issue and we look forward to further dialogue as we seek further feedback and commence implementation.

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Dispatch Down Draft Action Plan

Operational Action Plan – 6 to 12 months

Action	Description	Change dependency	Potential local RES Integration for a given period[4]	Delivery timelines
Progress an interim solution for downward regulation (negative reserve)	To date, the TSO has carried out the technical feasibility of applying a downward regulation reserve on wind turbines. Technical changes are required by the wind turbine operators and the system operator in the Wind Dispatch Tool. SONI has engaged with the renewable industry need to assess technical feasibility on existing fleet by end October 2024. SONI is drafting a downward regulation trial plan which will require renewable industry sign up and participation. The trial will be subject to sufficient resources being available to support trial.	Biweekly engagement September and October with industry to agree in principle technical solutions to provide Negative Reserve aligned to SONI's WDT requirements. Provide project status update to Operational Policy Review committee (OPRC) 24 October 2024. Approval of Operational Trial OPRC November 2024. Request to industry to participation of 300 MW Wind in Downward reserve trial. Lessons learned from trial Q2 2024.	+50 MW	Earliest adoption of downward regulation interim service via wind subject to approval Q4 2025.

[4] The "Potential local RES Integration for a given period" column provides a high-level indicator in Megawatt terms; but actual impact in real-time will be subject to the prevailing market conditions and the scheduling and dispatch actions in any given balancing period.

		Policy updates and governance approvals to change Q3 2025.		
Review of Operational Security Standards.	In particular, the technical feasibility of updating the N-DC criterion for the N-S tie-line. The decision point on Go / No-Go will require, a suite of technical studies, an operational trial and a formal approval process to adopt the policy (6 -12 months, including time for consultation and RA approval). Earliest Adoption subject to approval Q4 2025.	External consultancy support for OSS. Identify consultancy partner October 24. Action procurement of consultancy support. Workshop with consultants on OSS Nov 2024. OSS review and proposal for the application of a new contingency policy for double circuit towers in Northern Ireland. Red-line OSS proposal provided to SONI February 2025.	+50 to 75 MW of additional line flow between NI and RoI	OPRC briefing on proposed change to N-DC contingencies November 2024. OSS review completed red-line version available February 2025. Implementation of policy recommendations commence Spring 2025. SONI OSS updated, agreed and published in Q4 2025.
Perform a review to reduce the number of must-run units from 3 to 2	The technical feasibility of updating the number of must-runs within Northern Ireland under certain conditions. The decision point on Go, No-Go will require a suite of technical studies, an operational trial, and a formal approval process to adopt the policy (6 -12 months, including time for consultation and RA approval). The study outcomes determine if there are scenarios whereby reducing the must-run	Internal resources and technical expertise. Develop the plan for Techno-Economic Dispatch schedules, Dynamic, Fault level and Voltage Studies Q4 2024. Provide Project Status Update to OPRC Jan 2024. Approval of Operational Trial OPRC Q2 2025. Operational trial Summer 2025.	+60 to 100 MW (Dependency on economic dispatch for a given time period)	Northern Ireland two set rule trial in Summer 2025 under specific operational conditions.

	requirements are feasible, subject to voltage and stability security standards. If studies highlight an opportunity for a revised must-run regime, under specific condition, consideration must be given to minimum inertia levels, conservation of OCGT run hours and potential under demand thresholds. Overarching dynamic stability under all operating conditions requires the timely delivery and commissioning of Low carbon inertia service.	Lessons learned from trial Q4 2025. Policy updates and Governance approvals to change Q4 2025.		
Perform an independent review of technical feasibility to reduce minimum stable level across the Northern Ireland fleet.	The TSO will action an independent study to evaluate technical solutions to reducing the minimum stable level across the conventional units connected to the Northern Ireland Transmission system. The output of this review will enable the TSO to discuss relevant technical options with power station owners and the Utility Regulator, on the mechanism to evaluate the relevant grid code derogations and existing / new mechanisms to incentivise the delivery of technologies to reduce min gen of large thermal units.	AFRY review of minimum generating levels of NI CCGT and large OCGT fleet commissioned October 2024. Adoption of technology subject outcomes of review. Consideration will be required in relation to scheduling of outages to facilitate turbine upgrades one to two years. The Capacity T-4 / T-1 auctions provide an opportunity to recover the costs of prospective investments. The next T-1 Auction 26-27, next T-4 29/30.	TBD MW	AFRY review on all generators in NI Review complete Q1 2025. If technical solutions are identified, expected delivery on a thermal unit in NI earliest summer 2026.

Review of line rating policy to enable overload capability	Review the technical feasibility of updating line rating policy to align with NESO; engagement will be required with NIE Networks the asset owner. The decision point on Go / No-Go will require, a suite of technical studies, an operational trial and a formal approval process to adopt the policy.	Study to understand the value doing N-1 contingency considering overload capability.	TBD MW	6-12 months, including time for consultation and RA approval); earliest adoption subject to approval Q4 2025.

Operational Action Plan – + 12 months

Action	Description	Change dependency	Potential local RES Integration for a given period	Delivery timelines
Monitor the delivery of the Phase I Low Carbon Inertia Services.	There are two low carbon inertia service devices connecting to the Northern Ireland grid. There are incentives to encourage early delivery of the projects. TSO will engage closely with the project developer, UR and NIEN to understand whether there are actions that could bring forward an accelerated delivery.	Financial commitment made by developer to advance procurement of long lead equipment including cable and plant apparatus to accelerate delivery. SONI handover of project to NIEN. Further acceleration of project sits with NIEN within the construction period. Grid code changes to provide minimum technical standards for LCIS connecting to the Northern Ireland grid. SONI consultation closes in January 2025.	Reduction of one must-run. ~100 MW;	Coleraine LCIS commissioning expected November 2026. Coolkeeragh LCIS commissioning expected February 2027.

Commence procurement process of Phase II Low Carbon Inertia Services	The studies relating to locational needs for LCIS phase II will complete in Q4 2024; this will determine the need for additional devices connecting to Northern Ireland System. There are incentives to encourage early delivery of the TSO will engage closely with the project developer, UR and NIEN to understand whether there are actions that could bring forward an accelerated delivery.	All-island project funded by FASS. Cost Benefit Analysis studies presented to internal governance October 2024. Locational and volume analysis expected December 2024. Procurement process activated in 2025. The delivery of new LCIS technology in NI is dependent on locational needs identified and active participation of market players.	Reduction of one must-run. Estimated impact up to ~100 MW; subject to relevant technical studies. Volume and location dependent on output of LCIS studies.	Delivery expected 2029.

Market Action Plan – 6 - 12 months

Action	Description	Change dependency	Potential local RES Integration for a given period	Delivery timelines
Perform a review of ability of the TSO to reduce the net transfer capacity of the Moyle HVDC interconnector	As it stands there is a mechanism between SONI and NESO to manage the physical flow of power between SEM and GB. The approach to how this counter trade is managed is via the “OPI” and under legislation the UK-EU TCA. The decision point on Go, No-Go requires clarification on the legal aspects of reducing the Moyle NTC and the relevant compensation arrangements. SONI have carried out a legal review of the NTC reduction; but,	UK-EU Trade and Cooperation Agreement. SONI engage trilaterally with NESO and Mutual Energy on whether there are operational or market arrangements Q4 2024.	850 MW. (This value represents a swing from 450 Imports to 400 MW export; this action is dependent on prevailing market conditions.)	Legal review stated NTC reduction is subject to compensation.

	Further clarity is required with NESO and Mutual Energy on whether there are operational or market arrangements that could enable more flexibility trading in the balancing market.			
SONI to coordinate with the Utility Regulator to create a credible for a procurement mechanism to procure enhanced system flexibility through Long Duration Energy Storage.	The studies relating to locational needs for LDES to be complete by Q1 2025; the studies will determine the need for the volume and location of long duration energy storage connecting to Northern Ireland System. The procurement plan will provide clarity on the timeline for procurement commencement date, along with potential volumes and locations. SONI will engage with UR and NIEN to understand whether there are actions that could bring forward an accelerated delivery. The needs assessment needs to be aligned with EU regulation requirement; a locational assessment of the connection points along with e volumes needs to be carried out to provide input to the procurement. We will work with all parties to understand any viable opportunities for an accelerated pathway.	Carry out a discovery on the possible mechanisms for securing LDES in Northern Ireland. Stand up a specific LDES procurement project; draft a specific business Case to deliver an end-to-end solution for Q4 2024. ENSTOE to publish National flexibility needs assessment Methodology Q3 2025. Northern Ireland to publish flexibility needs assessment July 2026. Tender process Q1 2028. Project construction and delivery 2.5 Years (independent technical review). Commissioning of first assets in Q4 2030	Initial high-level analysis suggests 0.5 to 1 GW of battery flexibility composed from 2 to 6 hours batteries could reduce a dispatch down by 600 GWh or from 36% down to 15%. An economic assessment is required to understand the value that this volume of batteries adds. Volume through a National Flexibility needs assessment analysis is required to inform the procurement volumes to be verified by DfE.	Procurement mechanism established: Q2 2027. First Flexibility assets commissioned: Q4 2030.

Network Action Plan – +12 months

Action	Description	Change dependency	Potential local RES Integration for a given period	Delivery timelines
Construction of the second North-South Interconnector.	The second North-South Interconnector remains a critical piece of infrastructure that supports the Department for Economy's Energy Strategy. SONI has formally handed the project over to NIE Networks for construction.	Further timely delivery of the outstanding landowner consents. Timely construction. Timely project progress in the Republic of Ireland.	Circa +/-900 MW of additional grid flexibility. Actual flows on North-South Tie-lines are dependent on the prevailing SEM market conditions and operational security limits for any point in time.	Project formally handed over to NIE Networks for construction in December 2024. Construction timescales subject to Joint Programme Board updates, NIE Networks construction planning and progress in the Republic of Ireland.
Perform a review of ability of the TSO operate the existing or future batteries in NI to manage Network contingencies.	Virtual line. This is a concept whereby batteries could be used to provide a virtual line, so that line flows can be maximised without the need to build additional infrastructure or manage additional flow on existing double circuits.	Conceptual project. Initial discovery report by end of November 2025. Procurement mechanism expected to follow LDES mechanism and flexibility needs assessment.	TBD MW	Delivery expected Q4 2030.
SONI to coordinate with NIE Networks and the Utility Regulator to develop a plan to deliver a procurement mechanism to secure Dynamic	SONI and NIE Networks are currently working together on developing a procurement plan. SONI will engage with UR and NIEN to understand whether there are actions that could bring forward an accelerated delivery.	NIEN procurement. SONI CBA on the wider roll-out of DLR, by May 2025. IT project to integrate the DLR technologies. Regulatory approvals.	TBD MW	Procurement plan delivery by Q1 2025. Assets delivery as early as 2026 on strategic lines.

Line Rating technologies to enhance existing network capacity		North-South Interconnector as value behind constraint.		
Wider programme of network development	In line with our licence, SONI continues to bring forward a programme of network development to support further renewable integration, reduce constraints, facilitate demand growth and bolster security of supply. This programme is set out in the Transmission Development Plan. SONI has undertaken an internal acceleration project to explore options to reduce grid development timelines. Working with NIE Networks, SONI has established a Joint Project Management Office (JPMO). The purpose of the JPMO is to facilitate closer working between SONI and NIE Networks and provide more consistent, reliable and transparent project delivery timelines. We continue to engage with the Department for the Economy and the Utility Regulator on wider options for more transformation change. For further information: https://www.soni.ltd.uk/community/projects-in-your-area/tdpni	Collaboration with NIE Networks on JPMO programme. Planning timelines. Timely delivery of required statutory processes e.g. access to land. Construction timelines. Timely regulatory approvals.	TBD MW Dependent on project needs and system integration studies.	JPMO timelines to be finalised in early 2025.