

SONI Forward Work Plan

2022 – 23

Appendix 1 SONI Deliverables 2022-2023

Role 1 System Operation and Adequacy

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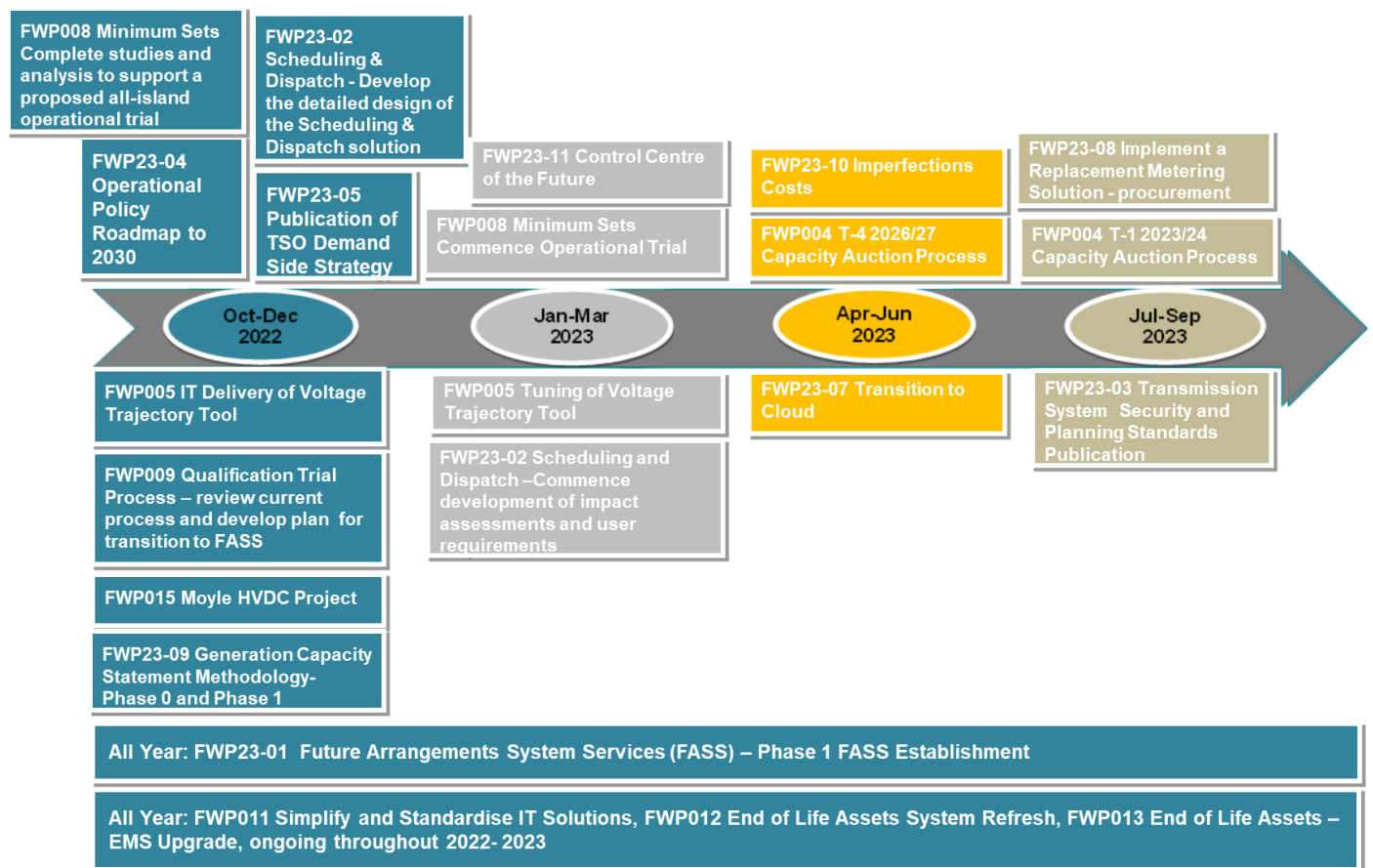
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SONI Deliverables 2022-2023 - Role 1 System Operation and Adequacy

The SONI Forward Work Plan provides details on the various projects and programmes of work that will be undertaken over the period from October 2022 to September 2023. This appendix document provides further detail on those deliverables associated with Role 1 System Operation and Adequacy should be read in conjunction with the main document.

Please note, that although there are IT related projects included under Role 1 System Operation and Adequacy as deliverables, SONI has not detailed any programmes of work associated with cyber security. SONI considers cyber security as a confidential area and therefore does not intend to include a narrative or metrics in the Forward Work Plans.

Overview of the projects



The table below provides a complete view of the projects being undertaken across Role 1 System Operation and Adequacy. These projects are expanded upon throughout this document.

Project	Milestone	Performance Measure	Engagement	Timescale
FWP23-01 Future Arrangements	High-level design of System Services products:	Progression of Phase 1	Consultations	December 2022 and ongoing

System Services (FASS)	<ol style="list-style-type: none"> 1. Progress the Auction Design 2. Compile a Detailed Project Plan 		Industry Workshops	throughout 2022 – 2023
FWP23-02 Scheduling and Dispatch	<p>Develop the detailed design of the Scheduling & Dispatch solution, including requirements for the treatment of new non-priority dispatch renewable generators in the SEM</p> <p>Develop impact assessments and detailed user requirements based on agreed / approved detailed design</p>	Delivery of Phase 1	Industry Workshops	<p>November 2022</p> <p>Commence January 2023</p>
FWP23-03 Transmission System Security and Planning Standards (TSSPS)	Review and refresh of the Transmission System Security and Planning Standards (TSSPS)	Delivery of Publication	Formal Consultation	July 2023
FWP23-04 Operational Policy Roadmap to 2030	Publication of the SONI Operational Policy Roadmap to 2030	Delivery of Publication	Engagement with Industry and Stakeholders via Shaping Our Electricity Advisory Council	December 2022
FWP23-05 TSO Demand Side Strategy	Publication of a TSO Demand Side Strategy	Delivery of Publication	Industry Workshops	December 2022
FWP004 Capacity Auctions Schedule	<p>T-1 2023/2024 Capacity Auction</p> <p>T-4 2026/2027 Capacity Auction</p> <p>Complete Transmission Impact Assessment Reports for the qualified T-3/T-4 generation applications</p>	Annual Audit	<p>Capacity Code Modifications Panel</p> <p>Consultations</p>	<p>July 2023</p> <p>May 2023</p>
FWP005 Control Centre Tools	<p>IT Delivery of the Voltage Trajectory Tool (VTT)</p> <p>VTT Go live</p> <p>Tuning</p>	Delivery of VTT	Internal Engagement	<p>December 2023</p> <p>March 2023</p>

FWP23-11 Control Centre of the Future	Develop a delivery plan for the tools and capability we need to operate the system to 2030	Delivery Plan Agreed	Internal Engagement	March 2023
FWP008 Minimum Sets	Complete studies and analysis to support a proposed all-island operational trial for operation with a minimum of 7 large synchronous units / 20,000 MWs inertia floor Commence the operational trial with a minimum of 7 large synchronous units / 20,000MW's inertia floor	RES-E & Imperfections Incentive	Internal Engagement Activities	December 2022 March 2023
FWP009 Qualification Trial Process	Review the current QTP Process and develop a plan for the transition to the System Services Future Arrangements Conduct Annual QTP Process to facilitate the integration of new technologies	Launch of New QTP Design and Tender for Applicants	Industry Consultation	December 2022 Annually
FWP011 Simplify and Standardise IT Solutions	Application Rationalisation Capacity Market Platform	Implementation of the Qualification Hub	Internal Engagement Activities	October 2022 ongoing Ongoing alignment to capacity auctions
FWP012 End of Life Assets	System Refresh	Delivery of all activities	Internal Engagement	Ongoing throughout 2022 – 2023
FWP013 EMS Upgrade	Energy Management System Midlife Upgrade Programme Phase 2	Delivery of all activities detailed	Internal Engagement	Ongoing throughout 2022 – 2023
FWP23-07 Transition to Cloud	Delivery of Cloud Foundations	Delivery of activities detailed.	Internal Engagement	June 2023
FWP015 Moyle HVDC Project – Telecoms	SONI requires IT hardware, software & resilient telecommunications circuits to replace current assets now at 18 years old.	Delivery of activities detailed	Internal Engagement and with Mutual Energy Limited	November 2022
FWP23-08 Implement a replacement	Procurement and Supplier Selection	Successful Procurement Process	Engagement with various stakeholders throughout	September 2023

energy metering solution				
FWP23-09 Generation Capacity Statement Methodology	<p>Phase 0: Develop a high-level plan on what is required to deliver a new resource adequacy</p> <p>Phase 1: Develop a high-level design for the modelling framework and a project migration implementation plan</p>	Phase 0 and Phase 1	Completion of Phase 0 and Phase 1	December 2022
FWP23-10 Imperfections Cost	Improved modelling of imperfections costs	Delivery of planned activities	Engagement between TSOs	April 2023

Role 1: Detailed Programme of Deliverables

Future Arrangements for System Services (FASS)

The Future Arrangements for System Services (FASS) project was formally launched by the SEM Committee (SEMC) in July 2020. This project is aligned under our Markets pillar of work within our Shaping Our Electricity Future Roadmap.

The SEMC consulted on the System Services Future Arrangements High Level Design ([SEM-21-69](#)) from August to October 2021. A decision on the High-Level Design was published in April 2022 ([SEM-22-012](#) FASS High Level Design Decision Paper).

SONI has engaged with the Regulatory Authorities¹ (RAs) to provide all information requested to aid in the SEMC HLD decision making process. The Utility Regulator's service priority regarding the facilitation of new technologies plays a key part in this programme. In the future, it is expected that the TSOs will increasingly contract for the provision of System Services from new technology types. These will likely include, amongst others, solar PV units and residential demand aggregators. It is anticipated that units aggregating residential demand will provide certain operating reserve services in the coming years. The Qualification Trial Process² provides a mechanism for trialing new technologies for the provision of system services.

The existing system services arrangements (DS3) were designed to meet the 2020 renewable targets of 40% RES-E and will not be sufficient to deliver the needed capability to achieve the Northern Ireland target of 80% renewable generation by 2030. Attracting investment and procuring sufficient volumes of system services capability from both existing service providers and new prospective providers, will be critical to meeting this target. It is important that the design for the future arrangements is agreed as soon as possible to ensure that appropriate arrangements can be implemented to further ensure that there is no break in the investment that is needed to meet 2030 targets.

SONI is currently working with the RAs on scoping the full programme of work. We expect this will include phases such as Establishment, Procurement, Design, Build and Operate.

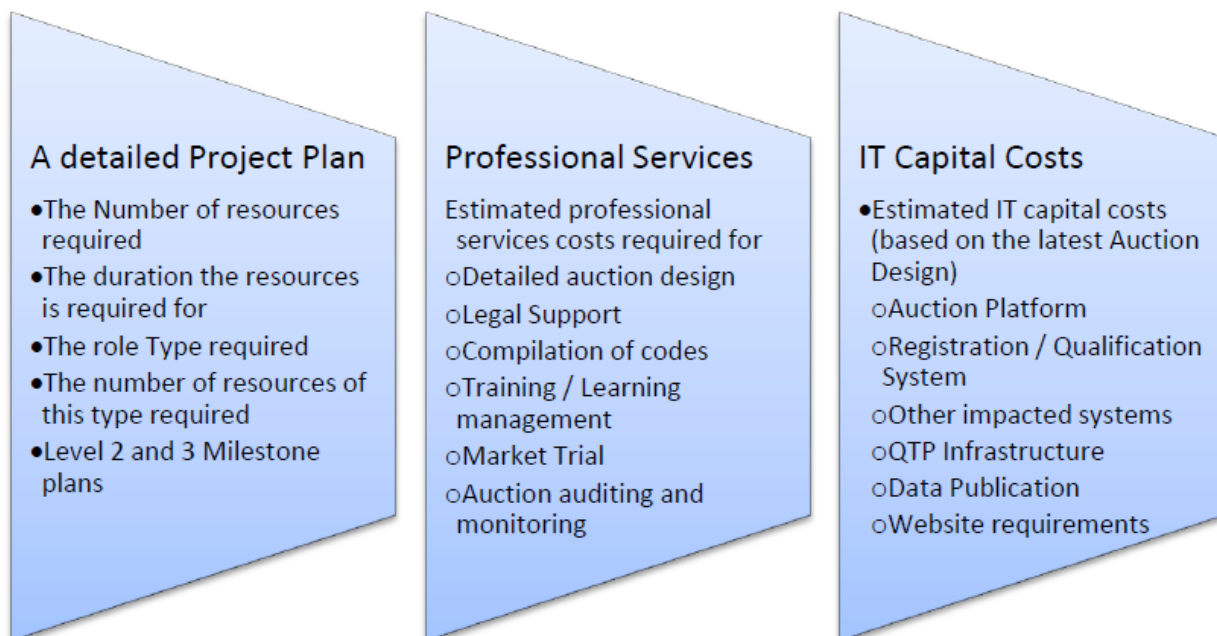
There is a growing need to drive new investment in system services to meet the technical challenges of managing real time operations of up to 95% SNSP by 2030. The suggested introduction of a new system services market design will need a number of years to mature to deliver the necessary investment in the required services.

The plan we have proposed has significant project implementation risks. These potential risks include the need for timely and appropriate regulatory decisions, both market design and programme resourcing, as well as a complimentary application of resources by EirGrid and SONI in delivering to these challenging timelines. This can only be achieved with a coordinated and focused industry working together to successfully achieve the Renewable Ambition.

During the initial phase of development of the project, the funding we received to date on the project will be used to deliver:

¹ The Regulatory Authorities (RAs) consist of the Utility Regulator for the Northern Ireland and the Commission for the Regulation of Utilities (CRU) for the Republic of Ireland.

² See Project FWP009 on page 32 to 35



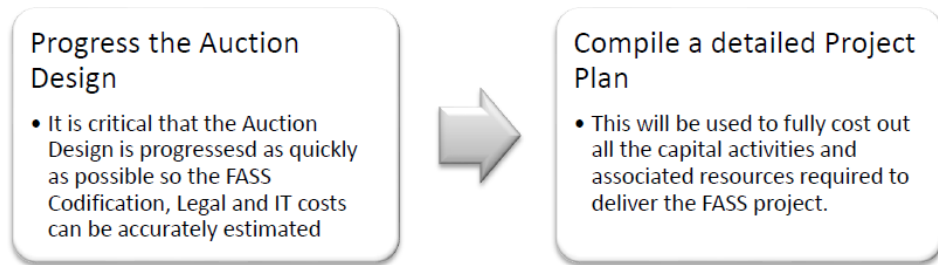
Work has commenced now that the HLD has been published and we estimate that the detailed design will be completed by the end of 2022 subject to timely decisions by the Regulatory Authorities.

More information on the associated milestones for the project during 2022-2023 is provided below.

Deliverable	FWP23-01: Future Arrangements System Services
Description of Activities	<p>On 18 July 2022 the SEM Committee published a letter to TSOs (SEM-22-039) - System Services Future Arrangements Next Steps.</p> <p>Our Shaping Our Electricity Future Roadmap identifies 3 key phases:</p> <ul style="list-style-type: none"> • Phase 1 New Daily Auction • Phase 1: Transition from DS3 System Services to Future Arrangements • Phase 2: Fixed Term Contracts for Zero Carbon • Phase 3: Development of new services and longer term risk management of Future Arrangements <p>Below is an overview of the project deliverables, with the key activities over the period highlighted in bold below:</p> <ol style="list-style-type: none"> 1. High-level design of System Services products for inclusion in the first Future Arrangements auction, including <ul style="list-style-type: none"> • Review of the efficacy of the existing system services products • Redesign of the products as required 2. Develop methodology and process for <ul style="list-style-type: none"> • Determining system services auction volumes (day/week ahead, dependent on regulatory design decisions) • Forecasting longer term system services requirements (e.g, year ahead horizon) 3. Implement: <ul style="list-style-type: none"> • Auction volume determination process ahead of first system services auction • Forecasting process for longer term system services requirements (e.g, year ahead horizon)

4. Ongoing review of efficacy of the system services arrangements and introduction of new services as required (e.g. congestion product)

Funding has been secured for two primary deliverables:



Based on SONI's understanding of the HLD the following items are expected to be progressed in this phase of work.

- The work required to develop a plan to implement a new System Services Code, Panel and overarching regulatory framework including any required agreed procedures
- The development of the High-level design into a detailed Auction design
- The expected cost of the various IT systems required e.g., Auction platform, registration, website, data feeds etc
- Documentation of the transitional arrangements
- Decommissioning and re registering activities
- Additional TSO / DSO processes and procedures, information sharing technical processes
- Identification of the necessary legislative and licence changes required to implement the FASS in Northern Ireland and Ireland
- Enduring business processes end-to-end design including service registration, service scheduling, service dispatch, service monitoring, service settlement and the associated IT systems impacted or required to enable – consideration may include the volume of service providers, the range of services and service providers
- Data: data acquisition from the service providers, how we manage data and information exchange in the operational & commercial space and how we provide data/ insights back to the service providers and industry is a major consideration

Key Benefits

The SEM Committee has assessed the benefits of this transition to the future arrangements for system services when making its decision around the High-Level Design. For completeness in this submission, SONI would highlight that the benefits of the FASS project include:

- A significant reduction in Carbon and GHG pollution
- A greening of the energy sector which is in line with the UK and NI Executive aspirations
- Improving our security of supply by reducing our dependence on fossil fuels
- Improved efficiency in the cost of procuring system services
- Providing certainty for investors in the technologies required to support our energy transition

UR Service Priorities	<p>A culture of open and collaborative innovation A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development Developing markets through competition and stakeholder engagement and collaboration</p> <p>System Services Future Arrangements is a very complex and challenging programme, as there are a number of high-level external dependencies and requirements for collaboration with the Regulatory Authorities. SONI will be working together with stakeholders on the implementation of the FASS programme, with the high-level design indicated by the RAs and consistent engagement throughout the project. SONI will also be engaged with the Utility Regulator as the programme progresses through each Phase in order to ensure that the level of funding required is achieved. The activities associated with the programme will also encourage a culture of organisational learning and innovation, as this is a complex programme of work there will be instances where solutions will be required to solve challenging issues and for learnings from elsewhere in the organisation to be brought forward to meet these challenges.</p>			
Engagement	<p>Over the period SONI will attend multiple workshops and consultations led by the Regulatory Authorities. These will facilitate opportunities for collaboration with the Regulatory Authorities, with SONI either providing support or taking a leading role dependent on the topic.</p>			
Performance Measure	<p>Performance for the period will be measured against the successful progression of Phase 1 (in bold above). SONI expects to attend a number of engagement activities led by the Regulatory Authorities as detailed above, and the success of these engagements will be assessed following the event (i.e., number of attendees, quality of interaction with SONI, feedback received).</p>			
Timescale	<p>Progress Phase 1 in the 2022-23 period, however, this will be subject to approval of appropriate funding by the UR</p>			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Scheduling and Dispatch Programme (SDP)

Renewable Energy Sources (RES) in the SEM have priority dispatch which effectively means their output is maximised in dispatch – e.g., whatever they are producing (based on the weather conditions) is used by the TSOs in dispatch, displacing other generation (fossil fuel), subject to security of supply and other statutory requirements.

RES is dispatched down (turned down or off) only as a last resort for two reasons:

- curtailment (too much wind overall) or
- constraint (too much in a part of the network)

Following decisions at European level in the Clean Energy Package, changes to how wind is to be treated in dispatch and redispatch (Article 12 & Article 13) have been under consideration by the Regulatory Authorities (RA).

The EU Clean Energy Package (CEP) has a number of implications for SONI's operations. In particular, CEP requires that TSOs provide for the dispatch of 'non-priority dispatch' renewables (until this point, renewables in the SEM have been subject to priority dispatch, functioning as 'price-takers' in the market to ensure this).

In support of Northern Ireland Government renewables targets for the electricity sector, SONI has also undertaken to define and implement a set of initiatives to allow them to operate the system under conditions of 80% total renewable energy and 95+% system non-synchronous penetration (SNSP) on an instantaneous basis. A number of these initiatives relate to how the system is scheduled and dispatched, and in conjunction with the related changes required to support compliance with the CEP we have grouped these together into the Scheduling & Dispatch Programme (SDP).

The RA decision paper on Dispatch, Redispatch and Compensation pursuant to Regulation (EU) 2019/43 ([SEM-22-009](#)) was published following on previous consultations relating to Articles 12 and 13 of the Clean Energy Package. Decisions included (but were not limited to) the following:

- Treatment on non-priority dispatch RES (and other previously eligible units) in dispatch
- Compensation for non-market based redispatch down of generation
- Timeline for pay-out of compensation.

The decision also acknowledges the complexity of issues, which will require workshops and engagement between SONI TSO and EirGrid TSO (due to the all-island nature of the system) and industry to discuss future solutions.

The objective of this phase of the SDP – Phase 1 – is to carry out key market design, business analysis and programme planning activities to support the execution of the complete Scheduling & Dispatch Programme.

The functional scope of the SDP is:

1. Treatment of Non-Priority Dispatch Renewable of renewables in scheduling and dispatch
2. Energy Storage Power Station (ESPS) integration
3. Fast Frequency Response (FFR)
4. Wind dispatchability improvements
5. Reserve services scheduling and dispatch
6. Synchronous condenser scheduling and dispatch

The Programme Phases are currently defined as:

- Phase 1 – Analysis
- Phase 2 – Detailed Design: detailed market design; process definition; detailed definition of solution requirements; selection of solution/service providers; rule/code change definition, etc.
- Phase 3 – Implementation: implementation of system and service provider solutions; testing; data; procedure definition; operational capability changes, etc.
- Phase 4 – Readiness & Rollout (may overlap other phases): training; market and operational readiness; trialing/commissioning; rollout and cutover.
- Phase 5 – Support: enhanced support through operational stability; planning for deferred items

Phase 1 will commence during the period and the approach to phase 1 is delivery via 2 consecutive sub-phases:

Phase 1a

Impact Analysis: The Impact Analysis will examine the high-level impact on SONI's system and market operator capabilities, in terms of systems, processes and people. This task forms a key precursor to later definition of functional scope (in Phase 1b).

Planning: Phase 1 work planning will determine a more precise schedule for the remainder of Phase 1, including identification of key activities, milestones, dependencies and deliverables.

Phase 1b

Phase 1b will carry out the substantive tasks of market design, business analysis and requirements definition, programme planning and structuring, and packaging and presenting this material for regulatory approval.

Market Design and Consultation: This activity will follow the proven market design process used in previous major projects relating to SEM changes:

- Identify key concepts to be addressed, through both review of background material and discussions with TSOs and MO.
- Prioritise the key market design objectives to clearly bring out why the change is being made.
- Based on the prioritisation, and in the context of any design concepts already pre-specified, break the market design process into a series of design topics
- Synthesise the solutions in relation to these topics into a Detailed Market Design document.
- Consult with stakeholders on the Detailed Market Design document.
- Submit the Detailed Market Design document to the SEM Committee for approval.

This exercise must also ensure that the design as a whole remains logically consistent.

Business Analysis and Requirements: This work will follow established methods for requirements identification, elaboration, documentation, validation and approval.

- Key functional, non-functional, technical and performance requirements will be identified
- Impact analysis will serve as the starting point, though not a limiting constraint, for identification
- Requirements uniquely identified and prioritised; clear, unambiguous and verifiable

- Aligned to market/domain and identify existing or prospective system – or options as appropriate – for delivery of the requirement.

Programme Planning and Structuring: The Programme Planning & Structuring activity will define the plans and structure for the overall programme such as:

- Define the scope and objectives
- Define the governance structure
- Define the programme workplan and organisation
- Define the resource plan and financial projections
- Define and set out the stakeholder engagement strategy and plan for Phase 2 though Phase 5 of the programme.
- Define the programme charter
- Update based on the design outcomes

The final stage of phase 1b is the SEM Committee Report and Approval Package. SONI will require approval from the SEM Committee in order to progress to Phase 2 and as such we intend to engage with the SEM Committee and RAs.

A programme of our associated project activities is provided below.

Deliverable	FWP23-02: Scheduling & Dispatch
Description of Activities	<p>Electricity wholesale market - Alignment and Implementation Scheduling and Dispatch</p> <p>Alignment of the energy market with high penetration of renewable generators - leading to scheduling and dispatch changes to ensure all market technologies and participants have equal access and opportunities.</p> <p>Over the period the following activities will be progressed:</p> <ul style="list-style-type: none"> • A series of industry workshops are to be held post publication of SEMC decision to develop the detailed solution to be proposed. • Develop the detailed design of the Scheduling & Dispatch solution, including requirements for the treatment of new non-priority dispatch renewable generators in the SEM - November 2022 • Develop impact assessments and detailed user requirements based on agreed / approved detailed design; - commence January 2023 • SEMC decision on submitted solution for treatment of new non-priority dispatch renewable generation under CEP – SEMC to determine the timeframe for its decision.
Key Benefits	<p>The key benefits of this programme of work will be ensuring that SONI is compliant with the EU Legislation regarding the Clean Energy Package. By carrying out the key market design works it also means that SONI are being proactive in our approach to ensuring we support the delivery of key government targets and we are aligned with the approach of the energy strategy in the Path to Net Zero.</p> <p>An important aspect of this project is that it is a key enabler to be able to transition from 75% SNSP which is currently operational to 95% SNSP by 2030.</p>
Strategic Theme	A culture of open and collaborative innovation:

	<p>A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p>			
	<p>This is an ambitious project as acknowledged by the SEM Committee given the complexity of issues, which will require workshops and engagement between SONI TSO and EirGrid TSO (due to the all-island nature of the system) and industry to discuss future solutions. This will also promote a culture of open and collaborative innovation – to discuss through workshops solutions and challenge the thought process to ensure all risks are identified and mitigated against.</p>			
	<p>It is also important against collaborating towards achieving our decarbonisation targets and achieving operational excellence – we are enabling the delivery of a low carbon future through this project and this will lead the way towards increasing our level of SNSP from 75% to 95% by 2030.</p>			
	<p>This activity will represent the UR’s service priority of a culture of organisational learning, we will challenge each other within SONI in order to ensure the most appropriate solution and risks are identified which will support our accountability, and planning demonstrating SONI’s agility and responsiveness in meeting policy, in this instance the EU Clean Energy Package.</p>			
<p>Engagement</p>	<p>SONI will require SEM Committee approval in order to progress to Phase 2 of the project. SONI intends to engage with the SEM Committee at an early stage to present the draft submission for their consideration, and following this SONI will also engage with wider industry on the proposed programme of work. The stakeholder engagement plan for Phase 2 through to Phase 5 of the programme will be developed at the conclusion of Phase 1 setting out proposed engagement strategy for FY23.</p>			
<p>Performance Measure</p>	<p>Performance will be measured over the period by the successful achievement of the Phase 1 activities as detailed above. SONI anticipates the completion of an impact analysis through to programme planning and scope over the period will provide a good measure of our performance in this programme of work.</p>			
	<p>Qualitatively, SONI will assess our engagement activities over the period to determine whether any engagement has been positive or negative and identify any improvements required. More information on how SONI engage and assess our engagements is provided in Appendix 6: SONI Stakeholder Satisfaction.</p>			
<p>Timescale</p>	<p>Develop the detailed design of the Scheduling & Dispatch solution, including requirements for the treatment of new non-priority dispatch renewable generators in the SEM - November 2022</p>			
	<p>Develop impact assessments and detailed user requirements based on agreed / approved detailed design; - commence January 2023</p>			
<p>SONI Outcome</p>	<p>Decarbonisation</p>	<p>Grid Security</p>	<p>System Wide Costs</p>	<p>Stakeholder Satisfaction</p>

Transmission System Security and Planning Standards

The Northern Ireland Transmission System Security and Planning Standards³ (“TSSPS”) are a set of standards that the grid is designed to meet. These standards are a licence obligation and are approved by UR. The TSSPS sets out the main standard that SONI shall use in the planning of the Northern Ireland Transmission System.

These standards form the basis to ensuring the economic and efficient development of the transmission system and to determine the economic levels of system security.

Given the evolving operational requirements of the Transmission System and the targets set out by the Northern Ireland Energy Strategy, SONI considers it is prudent to conduct a review and refresh of the TSSPS during the period. A programme of activities is detailed below.

Deliverable	FWP23-03: Transmission System Security and Planning Standards (TSSPS) Review and Refresh
Description of Activities	<p>The set of Transmission System Security and Planning Standards were developed, consulted on and approved by the Utility Regulator in 2015. It is planned in 2022/23 that these standards will be reviewed.</p> <p>The TSSPS will be reviewed in the context of the Energy Strategy. In particular the target of achieving 80% of electricity consumption from renewable generation by 2030 will require a review of the dispatch assumptions used in deterministic assessments.</p> <p>The scope of the review has yet to be finalised. Items that are expected to be included are as follows:</p> <ul style="list-style-type: none"> • The standards refer to a set of Electricity Networks Association Engineering Recommendations that were current in 2015. The review will focus on the need or otherwise to align with any updates. • The standards would make provision for hybrid generator/load connections. • The dispatch assumptions for deterministic studies will be reviewed. • The standards relating to an offshore transmission system will be reviewed. <p>As set out in Condition 20.3 of the TSO Licence, SONI must hold a consultation on proposed revisions to the TSSPS. Key stakeholders will include NIE Networks, EirGrid and parties liable to be impacted by the proposed revisions. Over the course of the review, a version of the TSSPS will be published for consultation, alongside a report on the findings of the consultation and the approved TSSPS will be required to be published following UR approval, as described in the TSO Licence.</p>
Key Benefits	<p>The key benefits will be bringing the TSSPS standards in line with the latest versions of the Electricity Networks Association Engineering Recommendations.</p> <p>As technology types have evolved since 2015, this will be a key policy review and allow us to consider other technologies which are pointed to in the Northern Ireland Energy Strategy and the Path to Net Zero publications.</p> <p>This activity will ensure that SONI continues to be a key enabler of facilitating renewable generation and that the Transmission System Security and</p>

³ The European electric power transmission networks are interconnected, so as to be able to transmit energy from one jurisdiction to others.

	Planning Standards are more relevant to the current needs of the Transmission System and future developers.			
UR Service Priorities	<p>A culture of effective engagement and collaboration A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p> <p>The project demonstrates SONI’s culture of organisational learning. We are being proactive in our approach to the review and refresh of the TSSPS acknowledging the changes that will be occurring to the Transmission System in order to facilitate a net zero future and we are being responsive to the need to address this now in order that we can be an enabler to achieving our renewable ambitions.</p>			
Engagement	<p>SONI will consult for a period of at least 6 weeks and welcome submissions from all parties. SONI will then review the feedback submissions and consider the nature of the feedback provided and how best to proceed.</p> <p>SONI will then publish all non-confidential responses and a response report to detail how we have considered the feedback provided.</p> <p>The final TSSPS will then be submitted for approval to the Utility Regulator, and we will welcome any engagement in order to discuss the proposed changes.</p> <p>The approved version will then be published on the SONI website and a notification issued from the SONI communication channels to advise of the revised version of the document.</p>			
Performance Measure	Completion of consultation process and qualitative assessment of feedback.			
Timescale	July 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

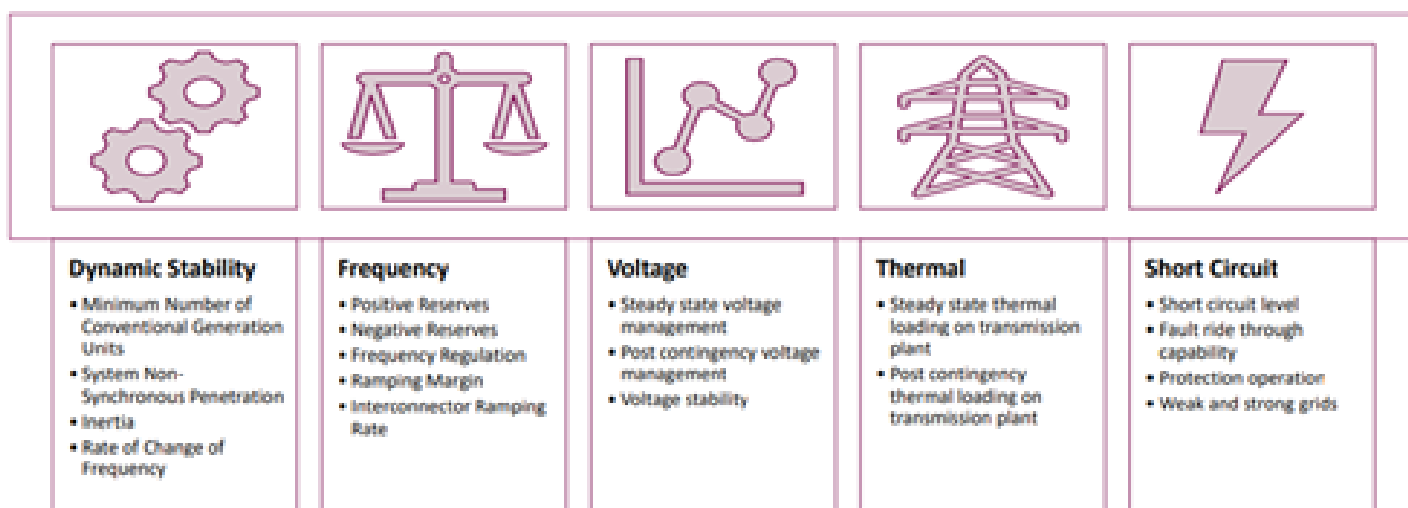
Operational Priorities – Operational Policy Roadmap to 2030

System Operation and Adequacy is strongly linked to the operational activities to ensure the Transmission System is safe, secure and reliable. Therefore, our key activities pertain to our Operational Roadmap to 2030 which is being developed this year.

One of our deliverables is the delivery of an Operational Roadmap to 2030. This will provide our key targets in order to achieve net zero carbon by 2050. The Operational Roadmap to 2030 will be published by December 2022.

SONI's operational policies are grouped into five key operational focus areas: Dynamic Stability, Frequency, Voltage, Thermal, and Short Circuit. These areas are aligned with the SONI Operating Security Standards.

System operation with high renewable penetration is more complex, with greater inter-dependency between the systems' parameters and metrics, making it difficult to clearly separate the policy areas into distinct entities. However, this aggregation into focus areas allows the information and roadmap actions to be grouped for further detailed analysis and action planning⁴.



The key operational policy objectives during 2023, as SONI continue to securely operate the system we will also be aiming to:

- Reduce the required minimum number of conventional units on the island from 8 to 7;
- Reduce the minimum inertia limit on the island from 23 GWs to 20 GWs;
- Reduce the negative reserve requirement on conventional units in Northern Ireland from 50 MW to 0 MW.

SONI published our Operational Policy Roadmap 2022 to 2023⁵ in June 2022. This includes a timeline for the Operational Policy Roadmap, which is provided on page 15, and the associated Operational challenges can be found on page 7 of this publication.

⁴ See pages 26, 97 and 99 - [Shaping Our Electricity Future Roadmap.pdf \(soni.ltd.uk\)](#)

⁵ <https://www.soni.ltd.uk/media/documents/Operational-Policy-Roadmap-2022-to-2023.pdf>

Deliverable	FWP23-04: Operational Policy Roadmap to 2030
Description of Activities	<p>Publication of the SONI Operational Policy Roadmap to 2030</p> <p>A key activity over 2022-2023 is the development and publication of an “Operational Roadmap to 2030” to set out our plans for evolving operational policy. This roadmap will set out target timelines for:</p> <ul style="list-style-type: none"> • Increasing SNSP from 75% to 95% in 2030 • Reducing the minimum number of large conventional units from 8 to 4 or less in 2030 • Lowering the inertia floor from 23,000 MWs to 17,500 MWs in 2030 <p>The Roadmap will then be updated every 2 years to detail the progress of our achievements and the plan as it evolves to 2030.</p>
Key Benefits	<p>The Operational Policy Roadmap to 2030 seeks to inform stakeholders of the work which we will be undertaking as we approach 2030 and will be refreshed every 2 years to acknowledge any relevant changes.</p> <p>This is a significant document as it sends a signal to stakeholders of the actions that are required in order to achieve 80% RES-E by 2030 now that the Government targets have been revised from 70% by 2030.</p> <p>This publication therefore brings an increased level of transparency and accountability for SONI as we are committing to the deliverables detailed in the publication and will be held to account by stakeholders and the Utility Regulator.</p>
Strategic Theme	<p>A culture of open and collaborative innovation:</p> <p>This publication is the next step in informing customers as to how SONI are leading the Island’s electricity sector on sustainability and decarbonisation, by highlighting the projects required on the approach to 2030.</p> <p>The activities require SONI to be innovative, we are already world leading in achieving 75% SNSP as no other TSO has implemented this and are ambitious in our plan to achieve 95% SNSP and these projects are challenging given the nature that they have never been completed by another TSO so there are no learnings to take into consideration from other areas.</p> <p>By committing to the projects set out in the Operational Policy Roadmap to 2030, SONI is being fully transparent with stakeholders and accountable to the deliverables which will be detailed in order to achieve our renewable ambitions. We engage in a culture of open and collaborative innovation, when proposing these projects, we consider all possible opportunities available and challenge each other to identify any risks and propose solutions to mitigate these. This deliverable shows SONI’s responsiveness to change in being proactive in providing a roadmap to 2030 as a follow up to our Operational Policy Roadmap 2022-2023⁶.</p>
Engagement	<p>SONI will be engaged with industry and stakeholders through our Shaping Our Electricity Future programme and Advisory Council meetings which are</p>

⁶ [PowerPoint Presentation \(soni.ltd.uk\)](https://www.soni.ltd.uk)

	detailed in Appendix 2: SONI Deliverables Role 2 Shaping Our Electricity Future Engagement.			
Performance Measure	Timeline to achieve publication and the progress on the plan through 2023 (i.e. undertaking of trials and successful updates to operational policy)			
Timescale	December 2022 for publication of the plan to 2030 and ongoing trials throughout 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

TSO Demand Side Strategy

Demand side response involves users of electricity (business, residential, commercial, or industrial consumers) having the capability to change their usage from their normal or current consumption patterns, to turn up, turn down, or shift demand in real time according to signals. For the demand side response service providers, this can provide significant benefits in terms of reduced bills for consumption of energy, potential sources of revenue for providing services, and reduced carbon footprint.

Significantly, demand side response can help SONI in managing the power system efficiently; including accommodating increased renewable electricity generation and providing enhanced system capacity. Demand side response is an important source of flexibility, energy balancing, capacity adequacy, system services, and congestion management. Enabling demand side response has consistently been recognised as important to enable the fulfilment of improved climate and renewable energy targets.

As part of our Shaping Our Electricity Future Roadmap⁷, a key activity is the development of a TSO Demand Side Strategy that aims to have industrial (including large energy users), commercial and residential demand fully participating in meeting the needs of the system with high levels of renewable generation.

More detail on the project is provided in the table below.

Deliverable	FWP23-05: TSO Demand Side Strategy
Description of Activities	<p>Development of a TSO Demand Side Strategy</p> <p>This strategy will consider:</p> <ul style="list-style-type: none"> - The drivers for the development of demand side response into the future - Understanding the existing and potential future categories of types and sources for response - Understanding the general characteristics of demand side response - Outlining the TSOs' broad high-level views on the development of demand side response - Outlining how demand side response can currently meet TSO needs and how it could meet these needs in the future - Outlining areas of work which would be required to enable demand side response to provide the most value it can, and - Engaging with stakeholders to incorporate their views into this strategy. <p>Engaging further with stakeholders will form part of the next steps after the publication of this strategy, which SONI will use to help take appropriate steps to identify, prioritise and plan the work required to analyse and develop the initiatives and solutions to resolve the challenges to demand side response raised in the strategy.</p>
Key Benefits	<p>Demand side response has a number of features which are advantageous in meeting TSO needs while enabling the transition to a high renewable electricity future, in particular how it can offer flexibility and services in a way which better complements renewable energy and</p>

⁷ Page 116, SONI's [Shaping Our Electricity Future Roadmap](#)

	<p>decarbonisation than other sources of flexibility and services such as conventional thermal generation. It also does so in a way which benefits the consumers who participate by either reducing their cost of consumption or providing them revenue for offering services.</p> <p>How the demand side response industry is enabled to develop further would affect the ways in which it is more or less impactful to the utility of the consumers. A strategy which considers the issues to be resolved and initiatives undertaken to best enable demand side response to develop further would be key to enabling the advantages demand side response has to offer in helping achieve the ambitious climate and renewables targets and energy transition to 2030 in the least cost, most economic, and least impactful way for end consumers.</p>			
Strategic Theme	<p>A culture of open and collaborative innovation A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development Developing markets through competition and stakeholder engagement and collaboration.</p> <p>SONI is being proactive in our approach to developing a TSO Demand Side Strategy, as this need is clear from the NI Energy Strategy that demand side response, industrial and residential, will play an integral role in Northern Ireland achieving our renewable ambitions.</p> <p>SONI will engage with stakeholders and investigate new ways to build on demand side response, taking the relevant steps to help develop these priorities after the completion of the strategy.</p>			
Engagement	<p>SONI will engage with external stakeholders to gain their feedback during the development of this strategy, including NIE Networks as DSO, the Utility Regulator and the Demand Side Management Industry representative bodies. Obtaining feedback on our views for the way forward will further inform SONI and therefore our TSO Demand Side Strategy. Continued engagement between SONI and industry will allow us to progress challenges and solutions through bilateral meetings, workshops and stakeholder submissions.</p>			
Performance Measure	<p>SONI will measure our performance against this deliverable against the successful delivery of the strategy publication.</p>			
Timescale	<p>December 2022</p>			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Capacity Market Auctions

Capacity Auction work secures the volume of capacity required at competitive rates and includes:

- Capacity Market Code secretariat and modifications process
- Determination of the parameters and auction information pack
- Capacity Market qualification activities
- Assessing the system impact of plant closures as a result of exit signals from the capacity auctions

The Capacity Market centres around annual Capacity Auctions that take place approximately four years in advance of delivery (T-4 auction) and approximately one year in advance of delivery (T-1 auction). These auctions match offers from Participants in respect of their Capacity Market Units against a Demand Curve set by the Regulatory Authorities. The auction is combinatorial in nature as it seeks to maximise Net Social Welfare subject to satisfying various constraints including inflexibility constraints (where offers are can be all or nothing) and Locational Capacity Constraints (where a certain predetermined quantity of capacity must clear in particular areas of Ireland and Northern Ireland).

The capacity market auction process which will be carried out over the period is detailed below.

Deliverable	FWP004: Capacity Auctions to be Completed
Description of Activities	<p>Capacity Auction process to be completed for T-1 2023/2024 capacity auction and T-4 2026/2027 capacity auction.</p> <p>Complete TIA (Transmission Impact Assessment) Reports for the qualified T-3/T-4 generation applications</p> <p>The timetables for completion of both capacity auctions are detailed below.</p>

Capacity Auction Timetable 2023/2024 T-1 Capacity Auction

Category	Appendix C	Event	Date & Time
Info	A.1	Initial Auction Information Pack Date	05/12/2022
Qualification	A.2	Opt-out Notification Date	19/12/2022
Qualification	A.3	Exception Application Date	16/01/2023
Qualification	A.4	Qualification Application Date	03/02/2023
Qualification	A.5	Provisional Qualification Results Date	14/04/2023
Review	B.19	Application for Review Date	18/04/2023
Review	B.20	Non-complying Application for Review rejection Date	20/04/2023
Review	B.22	System Operators request for further information Date	25/04/2023
Review	B.21	Participant provision of further information Date	27/04/2023
Review	B.22	System Operators notification of outcome Date	05/05/2023
Disputes	B.24	Qualification Dispute Notice Date	10/05/2023
Disputes	B.25	Qualification Dispute Decision Date	07/06/2023
Qualification	A.6	Final Qualification Submission Date	12/06/2023
Info	A.9	Final Locational Capacity Constraint Limits Date	30/06/2023
Qualification	A.7	Final Qualification Results Date	30/06/2023
Qualification	A.8	Qualification Results Publication Date	30/06/2023
Info	A.10	Final Auction Information Pack Date	30/06/2023
Auction	A.11	Capacity Auction Submission Commencement	06/07/2023
Auction	A.12	Capacity Auction Submission End	18/07/2023 10:00
Auction	A.13	Capacity Auction Run Start	18/07/2023 12:00
Auction	A.14	Capacity Auction Completion Date	25/07/2023
Auction	A.15	Capacity Auction Provisional Results Date	25/07/2023
Auction	A.15A	Capacity Auction Provisional Results Publication Date	31/07/2023
Post Auction	A.16	Capacity Auction Approval Date	31/08/2023
Post Auction	A.17	Capacity Auction Results Date	07/09/2023
Post Auction	A.18	Performance Security Date	25/09/2023

Note: Appendix C of the Capacity Market Code is referenced above.

Capacity Auction Timetable 2026/2027 T-4 Capacity Auction

Category	Appendix C	Event	Date & Time
Info	A.1	Initial Auction Information Pack Date	08/09/2022
Qualification	A.2	Opt-out Notification Date	22/09/2022
Qualification	A.3	Exception Application Date	06/10/2022
Qualification	A.4	Qualification Application Date	06/10/2022
Qualification	A.5	Provisional Qualification Results Date	01/12/2022
Review	B.19	Application for Review Date	05/12/2022
Review	B.20	Non-complying Application for Review rejection Date	07/12/2022
Review	B.22	System Operators request for further information Date	12/12/2022
Review	B.21	Participant provision of further information Date	14/12/2022
Review	B.22	System Operators notification of outcome Date	09/01/2023
Disputes	B.24	Qualification Dispute Notice Date	12/01/2023
Disputes	B.25	Qualification Dispute Decision Date	09/02/2023
Qualification	A.6	Final Qualification Submission Date	14/02/2023
Info	A.9	Final Locational Capacity Constraint Limits Date	01/03/2023
Qualification	A.7	Final Qualification Results Date	01/03/2023
Qualification	A.8	Qualification Results Publication Date	01/03/2023
Info	A.10	Final Auction Information Pack Date	01/03/2023
Auction	A.11	Capacity Auction Submission Commencement	15/03/2023
Auction	A.12	Capacity Auction Submission End	23/03/2023 10:00
Auction	A.13	Capacity Auction Run Start	23/03/2023 12:00
Auction	A.14	Capacity Auction Completion Date	28/03/2023
Auction	A.15	Capacity Auction Provisional Results Date	28/03/2023
Auction	A.15A	Capacity Auction Provisional Results Publication Date	04/04/2023
Post Auction	A.16	Capacity Auction Approval Date	02/05/2023
Post Auction	A.17	Capacity Auction Results Date	04/05/2023
Post Auction	A.18	Performance Security Date	15/06/2023

Key Benefits

Completion of the Capacity Market Auction Process is driven by grid security; therefore, we anticipate the completion of these 2 auctions to bring benefits to this SONI outcome. Given the all island nature of the capacity market and the associated engagement activities, we expect this will also bring about enhancements to the SONI service quality outcome.

Strategic Theme

In terms of capacity market delivery, SONI should co-ordinate with EirGrid in delivering the CRM and the Capacity Auctions, to ensure that all milestones and associated processes are met on time in keeping with published and approved timetables.

SONI considers this the most pertinent strategic theme – the capacity auction process is a vital part of SONI’s obligations to provide a safe, secure and reliable Transmission System. The capacity market delivery involves SONI coordinating with EirGrid in delivering the CRM and the Capacity Auctions. This is to ensure that all milestones and processes associated with the Capacity Market Auction are met on time in keeping with published and approved timetables.

Engagement

Engagement is an important process in the delivery of the Capacity Market Auctions.

	<p>SONI engages with market participants during the process, providing the timetable for the auctions in advance, providing auction packs and associated information and dealing with participant queries.</p> <p>SONI is also actively engaged with the Utility Regulator as part of the process. The Utility Regulator attends a weekly call with SONI and EirGrid to discuss Capacity Auction timelines, potential modifications to the Capacity Market Code, as well as general improvements to the Capacity Remuneration Mechanism in order to ensure it is still fit for purpose in an ever changing energy market..</p>			
Performance Measure	<p>SONI will measure our success across these auctions by monitoring the target timelines for completion of the above activities.</p> <p>Security of Supply will also provide indicative information around the success of the capacity auctions.</p>			
Timescale	<p>T-1 2023/2024 Capacity Auction – July 2023 T-4 2026/2027 Capacity Auction – May 2023</p>			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Control Centre Tools

This DS3 Control Centre Tools project will deliver a suite of Control Centre Tools to enhance the stability analysis, voltage control and frequency management capability of the control centre. This capability enhancement is necessary to increase the levels of instantaneous renewable generation on the system (SNSP). A core objective of the TSO and the DS3 Programme is facilitating levels of SNSP up to 75% to meet public policy. Additional tuning of the tools and development of enhanced capabilities is expected to conclude by December 2022.

Deliverable	FWP005: Control Centre Tools
<p>Description of Activities</p>	<p>IT Delivery of the Voltage Trajectory Tool</p> <p>Voltage Trajectory Tool (VTT): enables Grid Controllers⁸ to assess the impact of varying sources of reactive power across the power system to ensure that local voltage management issues are managed. Enhanced voltage control management capability in the control centre is critical to facilitate increased levels of SNSP⁹.</p> <p>Voltage management in Northern Ireland is becoming more challenging due to the reduction of available reactive power resources (through displacement of conventional plant) and the disperse location of wind farms (with different capability characteristics), combined with increasing installation of HV underground cables. Currently, an active transmission constraint dictates that there must be a minimum of 8 large synchronous machines on-load at all times in the all island system. To accommodate increasing amounts of non-synchronous renewable generation, this constraint must be relaxed. VTT will determine optimal reactive targets for different types of device, developing voltage trajectory plans secure against contingency events for a near time horizon (typically intra-day and day-ahead).</p> <p>This groundbreaking decision support tool will enable operation with reduced number of conventional plan on-line and, thus, will facilitate increased levels of SNSP in the All Island system. The Voltage Trajectory Tool has been scoped and developed throughout 2021 and 2022. Agile development, testing and validation are underway in cooperation with vendors and external consultants. SONI (and EirGrid) will be the first TSOs in the world to include this within their scheduling and dispatch processes.</p>
<p>Key Benefits</p>	<p>The Voltage Trajectory Tool is the first to be implemented in Northern Ireland. The Voltage Trajectory Tool is a decision-support tool that allows Grid Controllers to assess the impact of varying sources of reactive power across the power system, including of voltage control devices including dynamic and static reactive power devices</p> <p>As we facilitate more renewable generation on the system and reduce the number of conventional units, the management of system voltage will</p>

⁸ Grid Controllers operate the grid from Castlereagh House Control Centre (CHCC) Belfast. The grid controllers carry out the intricate task of matching electricity production to customer demand.

⁹ System Non-Synchronous Penetration (SNSP) is a real-time measure of the percentage of generation that comes from non-synchronous sources, such as wind & interconnector imports, relative to the system demand.

	<p>become more complex. The need for a voltage trajectory tool has been identified (through extensive analysis) to provide SONI with the capability to ensure the reactive power sources are managed efficiently on the system to maintain a healthy voltage profile.</p> <p>It is also a key enabler to removing system constraints, for instance in reducing the number of units from 8 to 7 requires the voltage trajectory tool to be in place.</p> <p>This project is therefore pivotal in SONI achieving our RES-E targets and progressing towards a net zero carbon future.</p>				
Strategic Theme	<p>A culture of open and collaborative innovation A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p> <p>In developing and implementing this project, SONI will achieve operational excellence by implementing tools in that this has not been completed before. These milestones are key enablers in achieving our target of 80% RES-E by 2030, therefore leading the electricity sector on decarbonisation. The Voltage Trajectory Tool will also assist in the management of voltage as we achieve our goals on the path to net zero, therefore maintaining Grid Security as the transmission system evolves and presents complex system needs, demonstrating SONI's proactive approach to ensuring these tools are in place for a decarbonised system.</p> <p>This contributes to SONI's Decarbonisation and Grid Security Outcome</p>				
Engagement	SONI will be engaged internally to ensure collaboration across departments and a coordinated approach to ensure the delivery of the voltage trajectory tool as this tool is a key enabler for other programmes of work and as such the UR will continue to receive regular updates from SONI.				
Performance Measure	Delivery of the Voltage Trajectory Tool				
Timescale	December 2022 for delivery and March 2023 for completion of tuning				
SONI Outcome	<table border="1"> <tr> <td>Decarbonisation</td> <td>Grid Security</td> <td>System Wide Costs</td> <td>Stakeholder Satisfaction</td> </tr> </table>	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction
Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction		

Control Centre of the Future

The Control Centre of the Future capabilities will need to be in place to meet the operational needs of the day and lay foundations for the future. Strategic choices are required that balance the business values, cost and complexity.

Deliverable	FWP23-11 Control Centre of the Future			
Description of Activities	<p>Implement the Control Centre of the Future Foundations</p> <p>Develop a delivery plan for the tools and capability we need to operate the power system to 2030, including but not limited to</p> <ul style="list-style-type: none"> • Interface with DSOs on visibility, management and forecasting of DER • Management congestion • Control new network devices • Improve models • Enable probabilistic operations <p>This plan will also cover the development of associated IT, data management and physical infrastructure to support the control centre tools programme.</p>			
Key Benefits	This will allow for additional collaboration with the DSO, during engagement around the plan for developing the interface and associated requirements and challenges and improved modelling.			
Strategic Theme	<p>A culture of open and collaborative innovation</p> <p>A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p> <p>Whole system collaboration and coordination with 3rd parties, and NIE Networks across its various roles as a TO, DNO and DSO</p> <p>The development of a delivery plan for the tools and capability we require to operate the power system to 2030 will require engagement and innovation in collaboration with third parties such as NIE Networks in their role as DSO. The development of a plan regarding interfacing with DSOs on visibility, managing and forecasting of DER will promote a whole system collaboration and coordination that is required in order to develop a robust plan. This will also require SONI to build on the organisational learning from other elements of the programme, such as the control centre tools project, and take the learnings from challenges encountered in that programme and apply these to the project in order to future proof the plan.</p>			
Engagement	SONI will be engaged internally to ensure collaboration across departments and a coordinated approach to ensure the development of a delivery plan as these tools will be a key enabler for other programmes of work and as such the UR will continue to receive regular updates from SONI. SONI will also be engaged with NIE Networks and Mutual Energy as part of the development of the plan and requirements.			
Performance Measure	Agreement on a delivery plan			
Timescale	March 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Minimum Number of Sets

The successful completion of the 75% SNSP trial will enable us to move on to further operational trials, for example reducing the minimum number of units and the inertia floor, all of which are required to further facilitate even higher levels of renewable generation.

Reducing the minimum number of large synchronous units on the all-island system from 8 units to 7 units is a challenge, for a synchronous system that is already at the forefront, worldwide, with regard to SNSP. It is worth noting that each of these large synchronous units is circa. 400 MW. Therefore, it will require a mixture of new technologies (some of which have only recently, or have not yet, connected) and some ingenuity, as well as operational experience and real time performance monitoring, to enable the reduction of minimum large synchronous units from 8 to 7, without reducing the transmission system security and reliability.

This requires SONI to be prudent and to implement this change on a phased basis, starting with studies and then progressing operational trials, all while developing operational policies, in parallel and finally implementing the enduring operational policy.

This next programme, reducing the minimum number of units, is detailed further below.

Deliverable	FWP008: Minimum Sets
Description of Activities	<p>Reduction of the operational constraints related to the minimum number of large synchronous units and the system inertia floor.</p> <ol style="list-style-type: none"> 1. Complete studies and analysis to support a proposed all-island operational trial for operation with a minimum of 7 large synchronous units / 20,000 MWs inertia floor by December 2022 2. Commence the operational trial with a minimum of 7 large synchronous units / 20,000MW's inertia floor by March 2023 (note that this trial is dependent on the delivery of the Voltage Trajectory Tool and that the above studies indicate that the trial can be undertaken safely and securely) 3. Commence work on the transition to system operation with 4 large conventional units or less (the interim steps will be laid out in the Operational Policy Roadmap to 2030 which will be published by December 2022. This work will commence in 2023 out to 2030.
Key Benefits	<p>The reduction of large synchronous units on the all-island system from 8 to 7 will have a significant positive impact on both RES-E and Imperfections and Constraints. This will therefore contribute to the Decarbonisation, Grid Security and System-Wide Costs Outcomes.</p>
Strategic Theme	<p>SONI should be considering ways to seek to minimise the imposition of constraint groups in dispatch to that extent only necessary for system security and safety in line with its obligations A culture of open and collaborative innovation</p>

	<p>A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p> <p>SONI are progressing key activities which will contribute towards achieving our RES-E targets and reducing transmission constraint groups on the transmission system, therefore affecting costs.</p> <p>These projects are innovative in that they are the first to be carried out by a TSO who is already leading in the System Non-Synchronous Penetration achievement of 75% operationally, which may in itself present additional challenges.</p> <p>SONI is adopting a prudent approach to ensure we retain a safe, secure and reliable Transmission System. However, we remain proactive in implementing these projects through into Operational Policy.</p> <p>We consider that this demonstrates SONI’s consideration around ways to minimise constraint groups for system security and safety, with the additional benefit of impacting on costs.</p>				
Engagement	SONI will conduct a series of internal engagements whilst progressing the programme of activities. Engagement activities will also focus around the Shaping Our Electricity Future updates which are detailed in Appendix X: SONI Role 2 Deliverables, Shaping Our Electricity Future Engagement				
Performance Measure	RES-E Completion of studies and associated analysis and the undertaking of a trial				
Timescale	As indicated above under Description of Activities				
SONI Outcome	<table border="1"> <tr> <td data-bbox="608 1368 847 1438">Decarbonisation</td> <td data-bbox="847 1368 1002 1438">Grid Security</td> <td data-bbox="1002 1368 1222 1438">System Wide Costs</td> <td data-bbox="1222 1368 1444 1438">Stakeholder Satisfaction</td> </tr> </table>	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction
Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction		

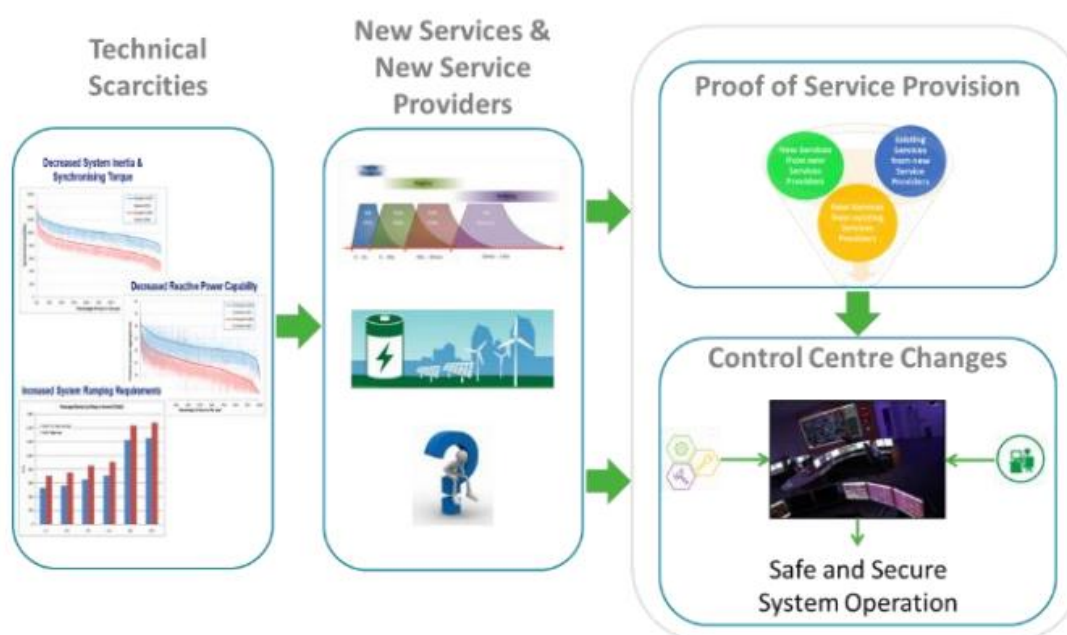
Qualification Trial Process

The Qualification Trial Process (QTP) is a key activity under the Operations pillar of SONI's Shaping Our Electricity Future Roadmap¹⁰. The Shaping Our Electricity Future Roadmap provides an outline of the key developments from a networks, engagement, operations and market perspective needed to support a secure transition to at least 70% renewables on the electricity grid by 2030 – an important step on the journey to 80% and to net zero by 2050.

The purpose of the QTP is to enable new technologies to prove their system services capabilities and to enable participation in the Central Procurement Process for the DS3 System Services Regulated Arrangements. It also assists the TSOs in the development of new codes and standards for new technology classes, and new processes and procedures for the commissioning and testing of new technologies.

Through our QTP, we research and develop innovative solutions that help us manage and integrate new and existing technologies. In doing so, SONI can develop a deep understanding of the operational complexities and suggest solutions on how best to integrate these technologies at scale on the power system. A high-level overview of the process is presented in Figure 1.

Figure 1: How QTP facilitates changes in system operation



There are several key principles which underpin the QTP:

1. The trials are run at small scale allowing participants to demonstrate provision of system services in small volumes. This demonstrates provision of services under real system operational conditions, but the small-scale nature of the trials also ensures security of the power system.
2. Outcomes of a technology trial will inform whether SONI consider a technology's ability to provide several system services within a service category as proven. An example of this is that successful participation in a primary operating reserve trial may be considered as proof of the capability to also provide secondary operating reserve.

¹⁰ Shaping Our Electricity Future – A Roadmap to Achieve our Renewable Ambition ([here](#))

3. The trials will inform whether the TSOs consider the capabilities of a technology class or sub-class as proven to provide a system service, and not a specific service provider or original equipment manufacturers. An example of this is that if a wind farm has been deemed to be proven under the wind category of trial for a service, this means that wind as a technology class has been deemed to be proven.
4. The failure of specific participant in the QTP does not necessarily exclude its technology class from provision of the service forever. Depending on the reasoning for the failure of a trial, SONI may elect to run a future trial with a separate service provider or alternatively consider other ways that may inform whether the TSOs consider the capabilities of a technology class or sub-class as proven.
5. Successful participation in a QTP does not guarantee that a service provider will obtain a contract in the Central Procurement Process for the DS3 System Services Regulated Arrangements. This will be subject to the technical requirements set out as part of the procurement process.

Deliverable	FWP009: Qualification Trial Process (QTP)
Description of Activities	<p>The QTP is the mechanism through which the TSOs are managing the transition to a wider portfolio of System Services' Providers and is a key element of the Operations pillar of our Shaping Our Electricity Future programme.</p> <p>The action to review the QTP process and develop a plan for the transition to System Services Future Arrangements is planned for Q4 2022. The launch of the new QTP trials will take place in advance of the launch of System Services Future Arrangements.</p> <p>The main activity for the period is:</p> <ol style="list-style-type: none"> 1. Review the current QTP Process and develop a plan for the transition to the System Services Future Arrangements by December 2022. 2. Conduct Annual QTP Process to facilitate the integration of new technologies (Annually) <p>By 2030, we are planning to operate at System Non-Synchronous Penetration (SNSP) levels up to 95%; to have a reduced inertia floor; to have implemented a secure Rate of Change of Frequency (RoCoF) limit of 1Hz/s (an operational trial is currently underway and expected to conclude shortly); and to have a significantly reduced minimum number of large synchronous units requirement.</p> <p>As we increase the current operational limits, we will have to increasingly rely on new technologies to provide the system resilience. In previous QTP trials, we have proven several technology categories.</p> <p>However, there are still technologies that cannot participate in the Central Procurement Process for the DS3 System Services Regulated Arrangements, as they are not deemed to be proven from a service provision perspective or they do not adhere to the current standards and compliance requirements, as outlined within the System Services protocol document.</p>

	<p>We consider that there remain potential trials that could be undertaken covering areas such as hydrogen-based technology, hybrids, and grid forming technology. It should be noted any potential trial involving participation of distribution-connected parties in Northern Ireland would only be progressed with the approval of the relevant Distribution System Operator (NIE Networks in Northern Ireland).</p>
Key Benefits	<p>Facilitating the integration of new technologies is vital in order to ensure we achieve our renewable target of 80% of electricity consumption from renewable sources by 2030.</p>
Strategic Theme	<p>A culture of open and collaborative innovation</p> <p>Through our QTP, we research and develop innovative solutions that help us manage and integrate new and existing technologies. In doing so, SONI can develop a deep understanding of the operational complexities and suggest solutions on how best to integrate these technologies at scale on the power system.</p> <p>Working together and engaging with participants in the QTP is a key part of the programme. This engagement during the trial process provides important information to SONI on the success of a technology type for instance or the need to conduct a further trial with another provider, as indicated above.</p> <p>SONI considers that this demonstrates a culture of open and collaborative innovation, by working together and engaging with participants prior to, during and following the trial process and therefore that we welcome this change and continue to pursue the development of this in order to align with the launch of the System Services Future Arrangements.</p>
Engagement	<p>In designing the next set of trials, in order to ensure that we can facilitate active participation by industry stakeholders, we sought stakeholder views on the current QTP process and areas the TSOs should focus on during December 2021 to January 2022.</p> <p>We are using this feedback provided from industry and the recent SEMC decision on QTP to shape the design of the next set of trials. More information will be provided in the 2022 Annual Innovation report¹¹ which is detailed in Appendix 2: SONI Deliverables Role 2 Independent Expert.</p>
Performance Measure	<p>Review the current QTP Process and develop a plan for the transition to the System Services Future Arrangements</p> <p>Conduct Annual QTP Process to facilitate the integration of new technologies</p>
Timescale	<p>1. Review the current QTP Process and develop a plan for the transition to the System Services Future Arrangements by December 2022.</p>

¹¹ Please refer to page 16, Appendix 2, FWP019 Annual Innovation Report

	2. Conduct Annual QTP Process to facilitate the integration of new technologies (Annually)			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Simplify and Standardise IT Solutions

SONI is experiencing multiple changes to our operating environment. This initiative comprises updates to our systems that are necessary in order to meet these evolving demands.

A detailed programme of activities for this project is detailed below.

Deliverable	FWP011: Simplify & Standardise IT Solutions
Description of Activities	<p>Application Rationalisation This relates to a general and ongoing activity to reduce the number of individual business solutions that are part of the application landscape.</p> <p>In FY21/22 SONI commenced a trial of the move of Plexos, a key energy modelling software platform, to the Cloud to investigate options around optimisation of performance and productivity for the teams that utilize it. This trial will continue into FY22/23. In addition, the move of Power Factory, a power system analysis tool, to centralized licencing is on track for completion on October 31st 2022 which provides many additional user benefits and improves productivity and efficiency.</p> <p>In FY21/22 SONI commenced a Database Rationalisation project to create a new central database repository which will be used to replace many of the corporate database estate. In FY22/23 SONI will continue Database Rationalisation. The new technologies will replace outdated technology which has been in use for 20+ years.</p> <p>In FY22/23 SONI will implement an EDIL Layered Product Upgrade which brings the EDIL platform up to date with supported version of Windows server 2019 and Oracle 19c. Currently, EDIL is running on Windows server 2012 and Oracle 12c which are end of life.</p> <p>Capacity Market Platform (CMP) The Capacity management Platform (CMP) went live in October 2018. There is an ongoing requirement to make small to medium changes to the platform to accommodate changing industry requirements and business and technical platform improvements.</p> <p>In FY21/22, SONI commenced the planning of an online qualification hub to capture and validate market participant applications, which can be audited for qualification for capacity auctions and streamlines the data capture process and will complete the implementation in alignment with the capacity auctions in FY 22/23.</p>
Key Benefits	<p>Information will be more accessible which is important to stakeholders and the implementation of the capacity market platform will streamline the data capture process and create efficiencies.</p>
Strategic Theme	<p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation SONI considers that this theme is aligned to the UR and DfE's expectations surrounding Data and Digitalisation in the context of the NI Energy Strategy. Having more accessible information is important to stakeholders and the implementation of the capacity market platform will streamline the data capture process and create efficiencies.</p>

Engagement	SONI will be engaged with other internal parties in order to coordinate and collaborate on the delivery of the above programme of work.			
Performance Measure	SONI will measure our performance based on the successful implementation of the qualification hub for the auction processes over 2022- 2023.			
Timescale	October 2022 – Power System Analysis Tool Application Rationalisation – throughout 2022-2023 Capacity Market Platform to complete in alignment with the capacity auctions in 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

End of Life Assets – System Refresh

Deliverable	FWP012: End of Life Assets
Description of Activities	<p>System Refresh</p> <p>Desktop Equipment Refresh In FY22/23 SONI will be in Windows 10 technology which was rolled out in FY21/22 (upgrade of both Corporate and Energy Management System PCs). This project will now progress to the refresh of display monitors in the control rooms. Ongoing hardware replacements of equipment 5 years or more will continue in line with industry best practice.</p> <p>VMware/Citrix Upgrades VMWare is a virtual platform that hosts the majority of SONI Enterprise applications, which reduces the need for physical hardware. In FY 22/23 SONI will continue with the virtual platform upgrade and migration of Enterprise servers. Decommissioning activities will also commence in Q1 which will reduce the overall data centre footprint.</p> <p>Server OS Upgrades</p> <p><u>Email Server Upgrade</u> SONI will continue migrating email capability to the Cloud which will provide greater resilience and facilitate collaboration. SONI will commence the decommissioning of on-premise email servers which will be no longer required.</p> <p><u>Backup Upgrade</u> SONI will continue to upgrade the backup hardware as the existing backup hardware is approaching end of life and needs to be replaced. Additional cyber security hardening enhancements will also be delivered on top of FY21/22 improvements.</p> <p>Data Centre Switching Upgrade SONI will continue the ongoing replacement of the data centre switches (every five years) to maintain support, ensure security and to cater for growing data volumes.</p> <p><u>Network Switch Life Cycle Management</u> The network switch hardware equipment is approaching end of life and will no longer be capable of accepting new firmware updates, and the hardware is no longer supported by the vendor. This exposes a risk to the SONI network infrastructure in terms of security and supportability. In FY21/22 SONI completed the refurbishment of network equipment in three data centre cabinets in the SONI Control Centre and in FY 22/23 will complete an additional six data centre cabinets.</p> <p>Floor Access Switching Upgrade In FY22/23 SONI will continue with the ongoing replacement of network equipment required to maintain support, ensure security and to cater for growing data volumes.</p>

	<p>Wireless IS Upgrade Phase 1 and Phase 2 of the Wireless LAN Upgrade Project is complete. In FY 22/23 SONI will continue with Phase 3 however SONI are experiencing supply chain issues with the delivery of the wireless access points which may delay the completion of Phase 3.</p> <ul style="list-style-type: none"> • Phase 1 - replace the existing wireless LAN infrastructure due to end-of-life elements; • Phase 2 - redesign the wireless LAN services to provide new functional and security features; and • Phase 3 - add additional wireless LAN access points to increase service coverage throughout the SONI Control Centre building. <p>Oracle Database Refresh ODS/ODH/CB upgrades In FY22/22 SONI will implement the high-level hardware designs (delivered in FY 21/22) for the dispatch systems and finance systems and a number of downstream support systems (compute, storage and network costs). The current hardware is approaching end of life and will provide SONI with the opportunity to upgrade the underlying software stack.</p> <p>Dynamic AX Upgrade The current Microsoft Dynamics AX platform, the Enterprise Resource Planning (ERP) solution has reached end of life and is out of service support. The upgrade to the Cloud-based version will deliver improved security. A modern ERP system in the Cloud will ensure that there is continued support for the Microsoft's Dynamics AX solution and alignment with the Dynamics AX 'out of the box' capability. In FY22/23, SONI will conclude the design for a new ERP Platform and commence the build out and testing of the new solution.</p> <p>NOTE: SONI is experiencing supply chain issues which could impact any of the above projects.</p>
Key Benefits	The ultimate benefit of this ongoing investment is the safe and reliable operation of our network on an ongoing basis, in accordance with our duty to achieve continuous system operation and adequacy. As such, we expect this programme of work to bring enhancements to our grid security outcome.
Strategic Theme	<p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation</p> <p>Having up to date internal systems is aligned under the above theme so that we can provide a reliable service to our customers and stakeholders. More up to date software is required especially in consideration of the potential for cyber threats, it is essential that we have resilient software to be able to continue to provide a safe, secure and reliable Transmission System.</p>
Engagement	SONI will conduct a range of internal engagement activities in order to ensure a coordinated and collaborative approach across the business in ensuring the delivery of the above programme of works.

Performance Measure	We will measure our success in this area by monitoring the timeframes to complete these activities, while endeavouring to make efficiencies in timeframes where possible and without additional cost.			
Timescale	Ongoing throughout 2022 – 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

End of Life Assets – EMS Upgrade

SONI has reviewed the optimum useful life of its IT assets and will refresh them on this basis. This programme includes mission critical systems, such as our energy management system that we use to operate the transmission system.

Deliverable	FWP013: End of Life Assets
Description of Activities	<p>Energy Management System Midlife Upgrade Programme Phase 2</p> <p>The EMS is a mission-critical platform utilised in our control centres to enable the monitoring and control of the power system of Northern Ireland and Ireland. The current platform is reaching end of life and the hardware, software and telecoms components must now be upgraded so that the resilience and availability of the critical process related to managing the power system can be maintained. This upgrade will ensure that the critical supporting systems are robust, resilient and modern and maintain appropriate support arrangements with vendors, ensuring access to new functionality, bug fixes, security patches etc. The primary objective of the current upgrade project is to address upcoming obsolescence of our EMS platform by upgrading from GE eterra v3.0 to v3.3.</p> <p>The project commenced in FY21/22. In FY 22/23 some of the key programme delivery activities/outputs are as follows:</p> <ol style="list-style-type: none"> 1. Delivery of the non-production and production environments across SONI primary and secondary data centres 2. Delivery of the new network infrastructure across SONI primary and secondary data centres 3. Delivery of GE application baseline (eterra v3.3) 4. Integrations testing 5. FAT testing 6. SAT testing 7. User Acceptance Testing 8. Non-Functional Testing <p>NOTE: SONI is experiencing supply chain issues which could impact this project.</p>
Key Benefits	<p>The ultimate benefit of this ongoing investment is the safe and reliable operation of our network on an ongoing basis, in accordance with our duty to achieve continuous system operation and adequacy. As such, we expect this programme of work to bring enhancements to our grid security outcome.</p>
Strategic Theme	<p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation</p> <p>Upgrading the EMS system is aligned under the above theme. More relevant software is required especially in consideration of the potential for cyber threats it is essential that we have resilient software to be able to continue to provide a safe, secure and reliable Transmission System.</p>
Engagement	<p>SONI will also be in regular contact with suppliers and liaising internally throughout this project.</p>

Performance Measure	We will measure our success in this area by monitoring the timeframes to complete these activities.			
Timescale	Ongoing throughout 2022 – 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Transition to Cloud

Where efficient, SONI is transitioning some services to Cloud. Cloud computing will improve security as providers hold internationally recognised security certifications that are beyond the reach of a single organisation. Additionally, updates and new releases are installed automatically by the service provider meaning that systems remain up to date. When designed correctly, Cloud services also improve resiliency as they can offer continuous access and improve business continuity.

The relevant programme details for the Transition to Cloud project are detailed below.

Deliverable	FWP23-07: Transition to Cloud													
Description of Activities	Cloud-hosting of software systems at SONI is a means of delivering our evolving IT solutions more quickly and operating them more cost-effectively. Cloud computing is scalable and elastic as well as more secure and reliable. This initiative therefore aligns with the requirement for SONI to build long-term resilience into our systems and processes.													
	<table border="1"> <thead> <tr> <th data-bbox="448 797 644 831">Project</th> <th data-bbox="644 797 963 831">Activity</th> <th data-bbox="963 797 1445 831">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 837 644 1021"> Initiative D2 Cloud Adoption </td> <td data-bbox="644 837 963 1021"> Server re-location </td> <td data-bbox="963 837 1445 1021"> Relocation of servers that will not be moved to co-located data centres to Cloud service providers (Infrastructure as a Service) </td> </tr> <tr> <td data-bbox="448 1028 644 1211"></td> <td data-bbox="644 1028 963 1211"> Cloud based applications </td> <td data-bbox="963 1028 1445 1211"> Transition to Cloud-based applications rather than installing on-premises versions (Software as a Service) </td> </tr> <tr> <td data-bbox="448 1218 644 1364"></td> <td data-bbox="644 1218 963 1364"> Cloud based services </td> <td data-bbox="963 1218 1445 1364"> Deployment of new Cloud-based services such as advanced analytics (Platform as a Service) </td> </tr> </tbody> </table>	Project	Activity	Description	Initiative D2 Cloud Adoption	Server re-location	Relocation of servers that will not be moved to co-located data centres to Cloud service providers (Infrastructure as a Service)		Cloud based applications	Transition to Cloud-based applications rather than installing on-premises versions (Software as a Service)		Cloud based services	Deployment of new Cloud-based services such as advanced analytics (Platform as a Service)	
Project	Activity	Description												
Initiative D2 Cloud Adoption	Server re-location	Relocation of servers that will not be moved to co-located data centres to Cloud service providers (Infrastructure as a Service)												
	Cloud based applications	Transition to Cloud-based applications rather than installing on-premises versions (Software as a Service)												
	Cloud based services	Deployment of new Cloud-based services such as advanced analytics (Platform as a Service)												
Key Benefits	The outputs of the movement to deploy solutions to the Cloud will be new services that are Cloud based. With this we expect: <ul style="list-style-type: none"> • Reduction in on-premises information technology infrastructure • Reduction in business continuity on-premises information technology infrastructure 													

	<ul style="list-style-type: none"> • Increased flexibility and reduced time to make solutions available to the business and to increase the volume of users and workload the solution can support • Greater solution availability • Access to solutions by employees no matter where they are and what time they need access to the solution • Access to a wider range of innovative solutions.
Strategic Theme	<p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation</p> <p>The transition to Cloud process will allow increased flexibility and demonstrates the changes SONI is implementing with consideration towards data and digitalisation in the context of the NI Energy Strategy, not solely focused on the decarbonisation aspect but also the benefits this can bring to employees by having a Cloud-based structure for information which allows greater accessibility to information by employees. This will bring benefits to those staff on site as projects are progressing or trials are underway to be able to access key information.</p>
Engagement	SONI will engage across the business to ensure the successful delivery of the Cloud foundations as detailed above, this will require coordination and collaboration across departments.
Performance Measure	Performance will be measured against the timely delivery of the Cloud foundations as detailed above.
Timescale	June 2023
SONI Outcome	Decarbonisation Grid Security System Wide Costs Stakeholder Satisfaction

Moyle HVDC Project - Telecoms

Deliverable	FWP015: Moyle HVDC Project - Telecoms			
Description of Activities	<p>SONI requires IT hardware, software & resilient telecommunications circuits to replace current assets now at 18 years old.</p> <p>The HVDC Moyle Interconnector is the 500 MW HVDC link between Auchencrosh, South Ayrshire in Scotland and Ballycronan More, County Antrim in Northern Ireland, which went into service in 2001 and is owned and operated by Mutual Energy.</p> <p>The control systems installed at the Moyle site are now end of life and Mutual Energy have contacted SONI to initiate a project to integrate the new control system into the SONI EMS. This includes the SCADA connectivity back to the SONI control rooms. This is currently operating on an analogue system utilising IEC 101, and will need to be replaced with an IP Solution utilising IEC 104. In addition, there a new set of requirements for the data to be dispatched, displayed and captured in the SONI EMS.</p> <p>To support Mutual Energy, SONI will require IT hardware, software and resilient telecommunications circuits to replace the current aging assets.</p> <p>The project is now near completion with a revised estimated final delivery date of November 22. The original estimated completion was September 2022 which was achieved as the project went commercial ahead of the original testing plan, but SONI has experienced supply chain delays for satellite communication infrastructure which will complete by November 2022.</p>			
Key Benefits	SONI anticipates that this work will bring enhancements to grid security.			
Strategic Theme	<p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation</p> <p>In order to support Mutual Energy, SONI will require IT hardware, software and resilient telecommunications circuits to replace the current aging assets, this includes coordination and collaboration with Mutual Energy throughout the project.</p>			
Engagement	SONI will be engaged with Mutual Energy throughout the programme of work to support mutual, collaborate and ensure coordination on our activities.			
Performance Measure	SONI will measure our performance against the successful delivery of this project.			
Timescale	November 2022			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Implement a Replacement Energy Metering Solution

Reliable and timely energy meter data is a fundamental requirement for the operation of all wholesale electricity market and retail markets. Under the various industry codes¹² in Northern Ireland, SONI is obliged to collect Meter Data from:

- transmission connected generators;
- the Moyle Interconnector;
- the North-South Tie Line; and
- all distribution connected generation that participates in the wholesale market or is subject to central dispatch (this covers all distribution generation with an MEC greater than 5MW).

This data is then used for settlement of:

1. The wholesale electricity market (SEM) with annual transactions of approximately £450 million¹³;
2. TUoS with an annual budget of approximately £45 million; and
3. System Support Services with an annual budget of approximately £70 million.

SONI's current energy metering system has been in operation for a large number of years. It has undergone many changes and component upgrades during that time. Some of the components are now required to be replaced or upgraded. SONI intends to test the market via a public procurement exercise to help determine a solution that best fits the current and future needs of power system operation and market operation obligations.

The SONI energy metering system currently consists of two parts:

1. A meter data collection facility; and
2. A collection of bespoke tools that are used to process the collected meter data.

The proposed scope of the replacement project is to acquire a product or products to replace both of these parts.

Deliverable	FWP23-08: Implement a Replacement Energy Metering Solution
Description of Activities	<p>The various phases associated with this project are detailed as follows:</p> <p>Analysis and Solution Specification, Solution Tender Development – FY23 The detailed requirements are gathered and documented, reviewed and agreed, the business rules are defined, a high-level solution is created, a detailed tender containing requirements, high-level solution design and evaluation framework is defined, reviewed and agreed.</p> <p>Procurement and Supplier Selection - FY23 A PQQ is written with the associated evaluation framework and issued and a short-list of vendors is created, the detailed RFP is issued to the short-listed vendors, the tender responses are evaluated and clarified if required, meetings are held with selected vendors, the winning vendor is selected following a detailed assessment.</p>

¹² These include the Metering Code section of the Grid Code and also the SEM Trading and Settlement Code.

¹³ This figure represents the SONI element of the SEM.

	<p>Future plans may include:</p> <ul style="list-style-type: none"> • Solution Implementation and Validation • Migration of Existing Energy Meters Data Feeds • Parallel Operation • Historical Data Migration <p>Over the period SONI will be progressing the first two stages:</p> <ol style="list-style-type: none"> 1. Analysis and Solution Specification, Solution Tender Development and 2. Procurement and Supplier Selection 				
Key Benefits	<p>There are three key benefits identified as a result of implementing this programme of work.</p> <p>1. Ongoing Compliance The current SONI metering systems are constrained. The systems have evolved with the requirements over several years resulting in a collection of applications and manual processes.</p> <p>2. Avoided Costs It is expected that the existing system will result in increasingly higher costs in terms of its operation and maintenance. Implementing a replacement solution will minimise the risk of higher costs by having updated and appropriate solutions in place.</p> <p>3. Essential New Functionality This investment is designed to be fit for purpose for the known requirements out to 2030 and beyond. It should also be able to process the data signals that will be essential for monitoring new technologies that require more frequent data readings, such as the fast response from batteries. This will ensure that customers only pay for services that are delivered.</p>				
Strategic Theme	<p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation</p> <p>This replacement for the metering system will deliver essential new automated functionality which will allow the business to move away from the current, more labour-intensive processes associated with the existing system.</p>				
Engagement	SONI is engaged with various stakeholders in these deliverables, with the Utility Regulator for funding approval, NIE Networks as Meter Operator, SEMO and EirGrid TSO who are also upgrading their own energy metering system.				
Performance Measure	Successful procurement process				
Timescale	<p>September 2023</p> <p><i>SONI are planning to avail of the efficiencies of running a joint procurement with Eirgrid TSO. The scope and delivery plan will be assessed on completion of the procurement to ensure the delivery is achievable within the allowances provided.</i></p>				
SONI Outcome	<table border="1"> <tr> <td>Decarbonisation</td> <td>Grid Security</td> <td>System Wide Costs</td> <td>Stakeholder Satisfaction</td> </tr> </table>	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction
Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction		

Generation Capacity Statement Methodology

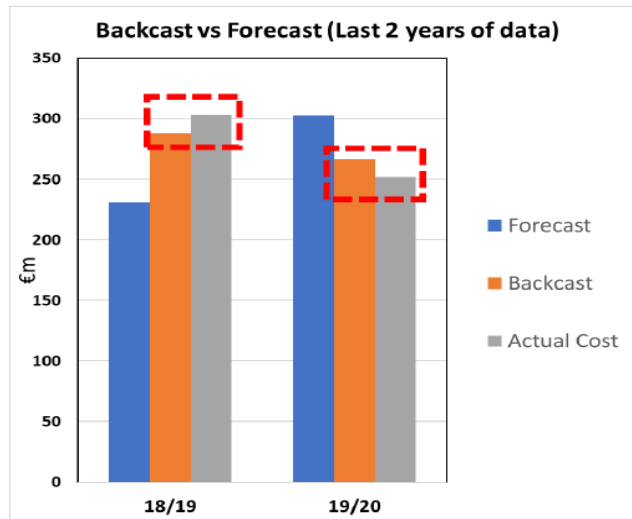
Deliverable	FWP23-09: Generation Capacity Statement Methodology
<p>Description of Activities</p>	<p>Improve the GCS methodology to meet the needs of the Island while aligning with National Resource Adequacy Assessment (NRAA) process (legal requirement¹⁴)</p> <p>SONI as TSO for Northern Ireland works collaboratively with EirGrid (TSO for Ireland) in the preparation of the All-Island Generation Capacity Statement.</p> <p>In the Generation Capacity Statement we outline the expected electricity demand and the level of generation capacity that will be required on the island over the next ten years. In order to prepare this annual publication, SONI carries out generation adequacy studies to assess the balance between supply and demand for a number of realistic scenarios.</p> <p>For Northern Ireland, the United Kingdom’s Committee on Climate Change recently advised that it is necessary, feasible and cost-effective for the UK to set a target of net-zero Green House Gas (GHG) emissions by 2050. The Climate Change Act 2008 (2050 Target Amendment) Order 2019 came into effect on the 27 June 2019. The revised legally binding target towards net zero emissions covers all sectors of the economy. This update to the Order demonstrates the UK’s and Northern Ireland’s commitment to targeting a challenging ambition in line with the requirements of the Paris Agreement.</p> <p>Over the period SONI will be reviewing our modelling systems to transition to Plexos and ensure that our methodology is aligned with the NRAA process. Moving to a new adequacy assessment methodology will enable us model a power system with at least 80% renewables; we are moving to a system where the greatest risk is no longer the loss of a thermal power plant, but uncertainties of disruption to gas supply and weather, particularly during extended periods of low renewable output.</p> <p>The associated deliverables for this project over the period are:</p> <ul style="list-style-type: none"> • Phase 0: Develop a high-level plan on what is required to deliver a new resource adequacy • Phase 1: Develop a high-level design for the modelling framework and a project migration implementation plan
<p>Key Benefits</p>	<p>SONI will be fully compliant with the NRAA process</p>
<p>Strategic Theme</p>	<p>A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p> <p>Collaborating and coordinating to promote a holistic, customer-based service approach to digitalisation</p>

¹⁴ Regulation (EU) 2019/943 Article 24

	These themes are significant in the context of the improvements being adopted to the system modelling in order to enable the transition to an updated methodology aligned with the NRAA process. SONI will embrace a culture of organisational learning whilst undertaking this process, using our learnings from other programmes which may help adapt to challenges which can arise during this process.			
Engagement	SONI will be engaged with the various internal departments and external vendors to ensure a seamless transition to the new methodology. This will entail a number of regular meetings and discussions on the approach and programme to deliver the methodology.			
Performance Measure	Timely delivery of Phase 0 and Phase 1 objectives			
Timescale	Phase 0 and Phase 1 to be completed – December 2022			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction

Imperfections Costs

Deliverable	FWP23-10: Imperfections Costs
Description of Activities	<p>Improved modelling of imperfections costs</p> <p>SONI will annually review the list of Transmission Constraint Groups (TCGs) for which the associated imperfections costs will be calculated, using the latest available Plexos backcast all-island model. This model represents actual data, from the latest completed full tariff year, i.e., 'Y-1' Cost determination will commence when the Backcast model is complete – March 2023.</p> <p>SONI will annually develop the imperfections cost savings achieved by SONI's activities and the imperfections costs associated with the list of TCGs, as calculated using the Y-1 backcast model – April 2023</p> <p>Note: To maximise process timelines, the study will focus on the more significant / material TCGs, which have the most impact on imperfections.</p> <p>SONI intends to use the backcast model, considering it to be the best model to use, when estimating the annual imperfections costs associated with constraints. The backcast contains actual data, rather than using a forecast model, which contains assumptions forecasted more than six months before the beginning of the tariff year. The design of a backcast model is to enable individual inputs and their impacts to be investigated in detail, whereas the intent of a forecast model is to determine the estimated total cost of Y+1.</p> <p>In terms of future constraint costs, assumptions such as fuel are very volatile and have a significant impact on the imperfections cost associated with constraints. No method of estimating the future annual imperfections costs, associated with constraints, is perfect but it is SONI's opinion that using backcast models to determine these costs would be annually consistent, not susceptible to unknown volatility, and less open to challenge, as we are using actual inputs rather than assumptions that will, no doubt, change and either increase, or decrease, imperfection costs.</p> <ul style="list-style-type: none"> • Forecast models are the TSO's best estimate of the year ahead imperfections – what happens in reality can significantly vary from assumptions, as noted in the 2021/22 year with large increases in fuel prices. • Backcast models provide an up to date model reflecting actual events and removes any issues that were outside the TSO's control.



The graph above shows a closer relationship between Actual versus Backcast, but more importantly, we know it is a more accurate model and a better baseline to perform any single factor analysis.

By introducing this new performance measure, SONI (in coordination with EirGrid in the operation of the All-Island Transmission System) is aiming to promote our role in mitigating and reducing imperfections costs.

SONI produce 4 Quarterly Imperfections Cost Reports which are published on the SEM-O website (TSO Responsibilities¹⁵), which will provide clear evidence of the imperfections reduction actions, progress on the plan, and the future improvements that SONI will make to remove or reduce the cost of each constraint in the next period.

Key Benefits

SONI actions during 2019/20, in collaboration with EirGrid as TSO for Ireland, regarding the list of transmission constraint groups, gave rise to imperfections cost savings of €22.44m in the 2020/21 tariff year. As such, four TCGs that provide all-island benefit were removed.

1. Negative Ramping Reserve in Ireland removed
2. SNSP increased from 65% to 70%
3. Reduction in minimum required Dynamic POR (as a result of Increased Batteries / DSUs): Reduced to 110 MW/75 MW & further to 87 MW/75 MW (Noting the lower 75MW values, these apply when there is at last one Turlough Hill unit in pump mode.)
4. Increased Non-Regulating Reserve (as a result of Increased Batteries)

The removal/easing of these four TCGs has been facilitated by the following system services: operating reserve contracts with batteries and Demand Side Units (DSUs) and Steady State Reactive Power (SSRP) contracts.

¹⁵ [TSO Responsibilities \(sem-o.com\)](http://sem-o.com)

	Given our recent activities regarding transmission constraint groups, for instance achieving operational policy at 75% SNSP, we expect these actions will bring further cost savings to actual imperfections costs.			
Strategic Theme	<p>A culture of organisational learning, accountability and planning that supports SONI agility and responsiveness in meeting policy, regulatory and market development</p> <p>SONI should be considering ways to seek to minimise the imposition of constraint groups in dispatch to that extent only necessary for system security and safety in line with its obligations</p> <p>The programme involves reviewing the transmission constraint groups for which the associated imperfections costs will be associated and develop these annually. There is an expectation that we will be able to use learnings from other projects and historic activities around the imperfections cost methodology that we can apply in practice and use the information from these learning exercises in order to incorporate improvements and forecasting what potentially challenges could require mitigation efforts.</p>			
Engagement	Engagement will take place between the two TSO's, SONI and EirGrid in coordination and collaboration of the all island process, as this cannot be completed jurisdictionally given the nature of constraints. SONI will also be continuously publishing the Quarterly Imperfections Costs reports which are published on the SEM-O website (see footnote 15)			
Performance Measure	Imperfection Costs			
Timescale	March 2023 April 2023			
SONI Outcome	Decarbonisation	Grid Security	System Wide Costs	Stakeholder Satisfaction