21/05/2024

Shaping Our Electricity Future

Advisory Council Meeting 8

21 May 2024

Belfast, N. Ireland

EirGrid SONI

Meeting Chairs: Alan Campbell, Eoin Kennedy

DURATION	START TIME	TOPIC	PRESENTER/S
15 min	10:30	Introduction, Welcome, and Housekeeping	Alan Campbell Eoin Kennedy
40 min	10:45	SOEF v1.1 Q&A	Workstream Leads
50 min	11:25	Discussion Topic: Tomorrow's Energy Scenarios	David Noronha Ben Coultate David McGowan
25 min	12:15	Grid Delivery in NI to 2030	Rónán Davison-Kernan Gareth Brown
40 min	12:40	Lunch	
25 min	13:20	Members Discussion: "What Makes a Consultation Process Effective?"	Jag Basi
15 min	13:45	Coffee Break	
40 min	14:00	Discussion Topic: HV Interface Forum	Louise O'Flanagan
30 min	14:40	Member Discussion: Heat Sector	Thomas O'Sullivan
40 min	15:10	Discussion Topic: Joint Outage Transformation Programme	Philip Kennedy Niall Kearns
5 min	15:50	Housekeeping – Actions Follow-up, AC Member Refresh	Edel Leddin
5 min	15:55	Closing Messages	Alan Campbell Eoin Kennedy
	16:00	***Meeting End***	

SOEF v1.1 Q&A

All SOEF v1.1 updates are provided as pre-read material.

The 45 minutes of meeting time will be used for Member Q&A.

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SOEF Advisory Council Meeting #8

Introduction from the Chairs

- *Alan Campbell*
- *Eoin Kennedy*

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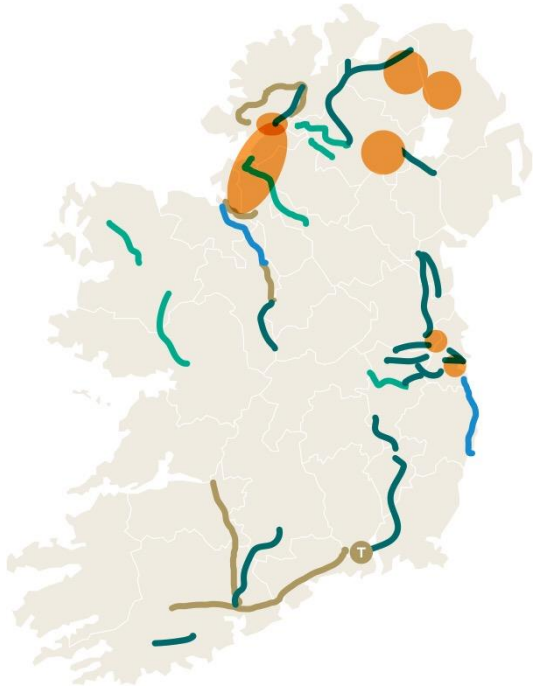
Q&A: SOEF v1.1 Updates

- *Workstream Leads*

Shaping Our Electricity Future Roadmap - Recent Achievements



SOEF v1.1: Jan - April '24

Operational constraint for large synchronous units reduced to 7

Contract Award Notice published for Phase 1 Low Carbon Inertia Services in Northern Ireland

Markets

- FASS Integrated Programme Plan and Day Ahead Auctions (DASSA) design consultation published in Mar '24
- ACER approved the SEM-FR Capacity Calculation Region proposal in Mar '24
- Scheduling & Dispatch funding approved, and vendor contracts signed in Mar '24
- SDP System build phase commenced in Apr '24

Network Infra Enablers & Engagement

- EirGrid and ESB Networks published note to industry on the Joint Outage Transformation Programme (JOTP) outlining the 18 initiatives planned in Jan '24
- Integrated first DLR (Lisheen-Thurles) with Energy Management System in Mar '24

MARKETS

OVERALL STATUS


Overall Summary and Status

- Strategic Programmes continuing at pace and ongoing engagement with industry on same.
- Funding is an ongoing risk.

Key Highlights

- Funding approved by the Regulatory Authorities for the delivery of the Scheduling and Dispatch Programme.
- The Phased Implementation Roadmap was published for the Future Arrangements for System Services.
- The daily auction design consultation was published for the Future Arrangements for System Services and a workshop held with industry on same.

Upcoming Milestones

- Recommendations paper to go to the RAs in relation to the daily auction design for the Future Arrangements for System Services.
- Regular monthly industry workshop.
- Memorandum of Understanding with National Energy System Operator (formerly National Grid Electricity System Operator in GB) in relation to future markets and where we can leverage learnings.

Key Risks or Issues

- Need for a holistic multi year plan outlining all the key changes needed and to be bought into by eco system
- Asks for extensions to closing dates causing knock on impacts. Welcome feedback from Advisory Council on how we mitigate extensions to consultations.

SYSTEM OPERATIONS

OVERALL STATUS


Overall Summary and Status

- Good progress has been made across a range of areas (see slides 128-138 for further detail).
- The operational trial with a reduced minimum requirement for large synchronous generators, from 8 to 7, has concluded and became enduring policy from 7 April 2024.
- A suite of studies looking at operation at SNSP levels up to 80% is underway to assess the possibility of commencing an 80% SNSP operational trial later this year.

Key Highlights

- The operational trial with a reduced minimum requirement for large synchronous generators, from 8 to 7, has concluded and became enduring policy from 7 April 2024.
- A suite of studies looking at operation at SNSP levels up to 80% is underway to assess the possibility of commencing an 80% SNSP operational trial later this year.
- The Contract Award Notice has been published for Phase 1 Low Carbon Inertia Services in Northern Ireland. The procurement process is still ongoing in Ireland.
- An operational trial with an increased All-Island HVDC Interconnector Ramp Rate has commenced.
- RA-TSO SOEF Ops Programme of Work for delivery is being established, including monthly meetings to discuss progress.

Upcoming Milestones

- An EirGrid TSO Demand Side White Paper has been developed and will be published shortly.
- We have completed a review and developed a timeline for over-install, following a decision from CRU. This is due to be published in May.
- Development of a System Strength Policy has begun. A workshop will be held during the summer to share the latest thinking and get stakeholder feedback.

Key Risks or Issues

- Large Energy User (LEU) Protection Settings: The demand response of multiple data centres to a fault on the power system continues to present challenges to the resilience and stability of the power system. EirGrid held a data centre industry webinar on 30 April 2024 to ensure industry awareness of the issues and to set out proposals for next steps to resolve the issues.
- There is a risk of delays to the delivery of necessary capabilities resulting in delays to our ability to make the operational policy changes needed to accommodate higher penetrations of renewable generation.

NETWORKS INFRASTRUCTURE (NI)

OVERALL STATUS


Overall Summary and Status

- Mid-Antrim Upgrade optimum substation site location and overhead line route determined & landowner engagement commenced (SOEF No.1).
- Tamnamore-Drumnakelly Reinforcement TNPP approval received in Mar-24. Progressed to Part 2 of SONI's Grid Development Framework (SOEF No. 6 & 52).
- Tamnamore Land Purchase TNPP submitted to the UR for approval in Dec-24 (building block for SOEF No. 8).
- Cam Cluster Substation Extension TNPP submitted to the UR for approval in Feb-24 (building block for SOEF No. 4, 7 & 47) with basic Cam Cluster in Part 2.
- Establishing SONI & NIE Networks Line Rating Working Group (SOEF No. 45).

Key Highlights

- SONI's "Grid Acceleration Project" is progressing well and on target for a set of actionable recommendations by June-24.
- SONI's proposal to shift our default approach for land access from wayleave to easements progressing with the UR.
- Transmission Cluster policy being progressed with next steps to collaborate with NIE Networks and industry.
- Widespread engagement with elected representatives on the need for cross-government and cross-industry partnership to meet the 2030 targets.

Upcoming Milestones

- Mid-Tyrone Upgrade TNPP to be submitted to the UR for approval May-24 (addresses SOEF No. 8).
- Transmission Development Plan NI 2023-31 to be submitted to the UR in May-24.
- We anticipate decision soon from the DfE on Necessary Wayleaves for 2nd North-South Interconnector to bring consented landowners from ~50% to ~70% (key enabler for 2030).

Key Risks or Issues

- Business as usual on Grid Delivery is not enough to support 80x30 and we are participating in the DfE's 80x30 Working Group.

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NETWORKS INFRASTRUCTURE (ROI)

OVERALL STATUS

Overall Summary and Status

- 30 Candidate reinforcements listed in SOEF 1.0 & 1.1 progressed into Framework for Grid Development
- Overall SOEF project pipeline, and progression of projects through the framework remains on schedule.

Key Highlights

- Non-shaping projects progressed into Framework for Grid Development, including 3 additional DLRs projects & station developments.
- Engagement with DECC and CRU about Renewables Transmission Hubs initiated.
- **Planning Applications**
  - **Kildare Meath:** EIAR prep and lodgement to ABP March ’24
  - **East Meath North Dublin:** Planning lodgement to ABP March ’24
  - **Bandon - Dunmanway 110 kV:** Planning grant received from Cork CC – with ABP for review: May ‘24
  - **Louth - Woodland 220 kV Uprate:** Planning grant received from Louth and Meath CC’s – with ABP for review: January ‘24
- **Capital Approvals**
  - Cashla – Dalton 110 kV: January ’24
  - Castlebar – Dalton 110 kV: January ’24
- **Project Agreements**
  - Great Island 220-110 kV Transformer Upgrades: January ’24

Upcoming Milestones

- Further engagement with CRU on Renewables Transmission Hubs and milestones with ARE Taskforce.
- **POWERING UP DUBLIN:**
  - Progressing Finglas/Northwall Cable project towards Project Agreement by end of 2024. Aiming to submit MARA MAC applications for Carrickmines/Poolbeg and Northwall/Poolbeg in Summer 2024
  - Project Agreement for Belcamp and Poolbeg 220kV Stations by end of 2024
- **North Connacht** – Wrap up engagement with Roads Authorities, Procure contractor, continue construction.
- **Upcoming Capital Approvals**
  - Arklow - Ballybeg - Carrickmines 110 kV capacity Needs
  - Athy - Carlow 110 kV circuit 1
  - Drumline – Ennis 110 kV
  - Gorman-Maynooth 220kV

Key Risks or Issues

- Third party Land Acquisition
- MARA/ MAC application timelines
- Outage availability – OTP
- Acceptance of Roads Authorities of UG Cable infrastructure within existing roads

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PUBLIC ENGAGEMENT

OVERALL STATUS


Overall Summary and Status

- Strategic parallelling of unprecedented levels of engagements and consultations across Network Projects Ireland Programme, Network Projects Dublin Programme, Celtic Interconnector and North South Interconnector.
- SOEF Engagement Roadmap on target, evolving and growing as partnerships nationally and internationally grow.

Key Highlights

- Local Authorities collaborate with EirGrid providing panellists at Energy Citizen Roadshows – Wexford and Clare Council launch Climate Action Plans at EG Roadshows.
- Progression of Landowner Engagement on North South Interconnector.
- Advisors to UK Gov Dept for Business, Energy & Industrial Strategy prior to their consultation on community benefits for network infrastructure.
- Establishment of Dublin Infrastructure Forum has resulted in the reduction of circa 22km of works in public roads. This was possible through collaborating with agencies and local authorities to minimise disruption on businesses and communities – expediting programme delivery.

Upcoming Milestones

- Multiple Consultations and Information Campaigns across several major projects.
- Engagement with coastal communities on Offshore Delivery.
- Collaboration with TSOs across the EU to agree public engagement guiding principles.

Key Risks or Issues

- Stakeholder Fatigue.
- Competing with Industry and others for land access and acquisition to develop state infrastructure.

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SOEF Advisory Council Meeting #8

Discussion Topic: Tomorrows Energy Scenarios

- *David Noronha*
- *Ben Coultate*
- *David McGowan*

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Shaping Our Electricity Future: Advisory Council

Tomorrow's Energy Scenarios & Post 2030 Network Planning

May 2024

TES 2023 & Strategic Planning

Agenda

- Scenario Framework
- Feedback from TES 2023 consultation
- TES 2023 results
- Post 2030 network planning
- Questions and discussion

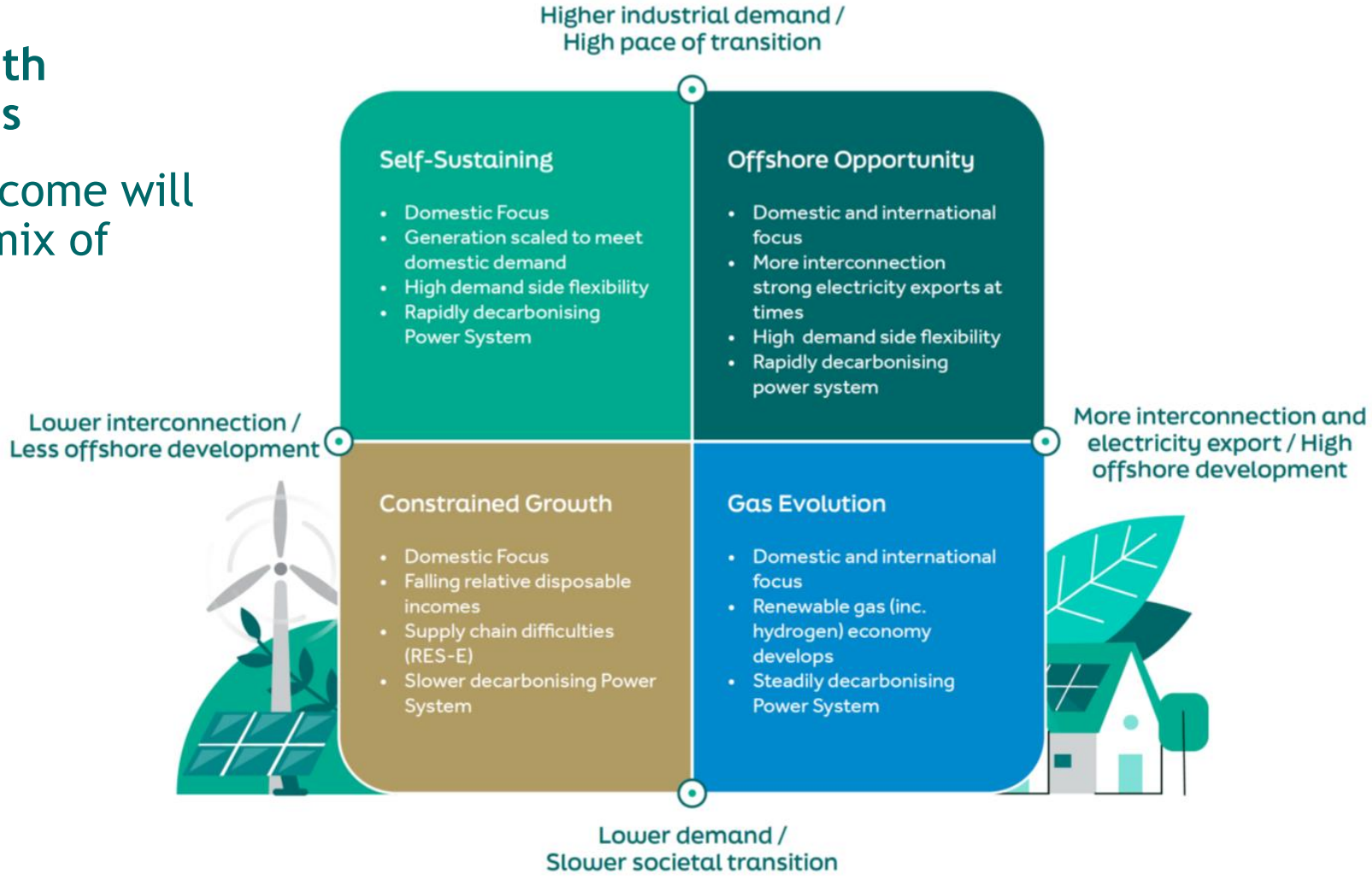
EirGrid & SONI Speakers

- David Noronha
- David McGowan
- Ben Coultate

Scenario Framework Approach

TES 2023 explores scenarios with challenging boundary conditions

We expect that the resulting outcome will lie within the boundaries and a mix of scenarios



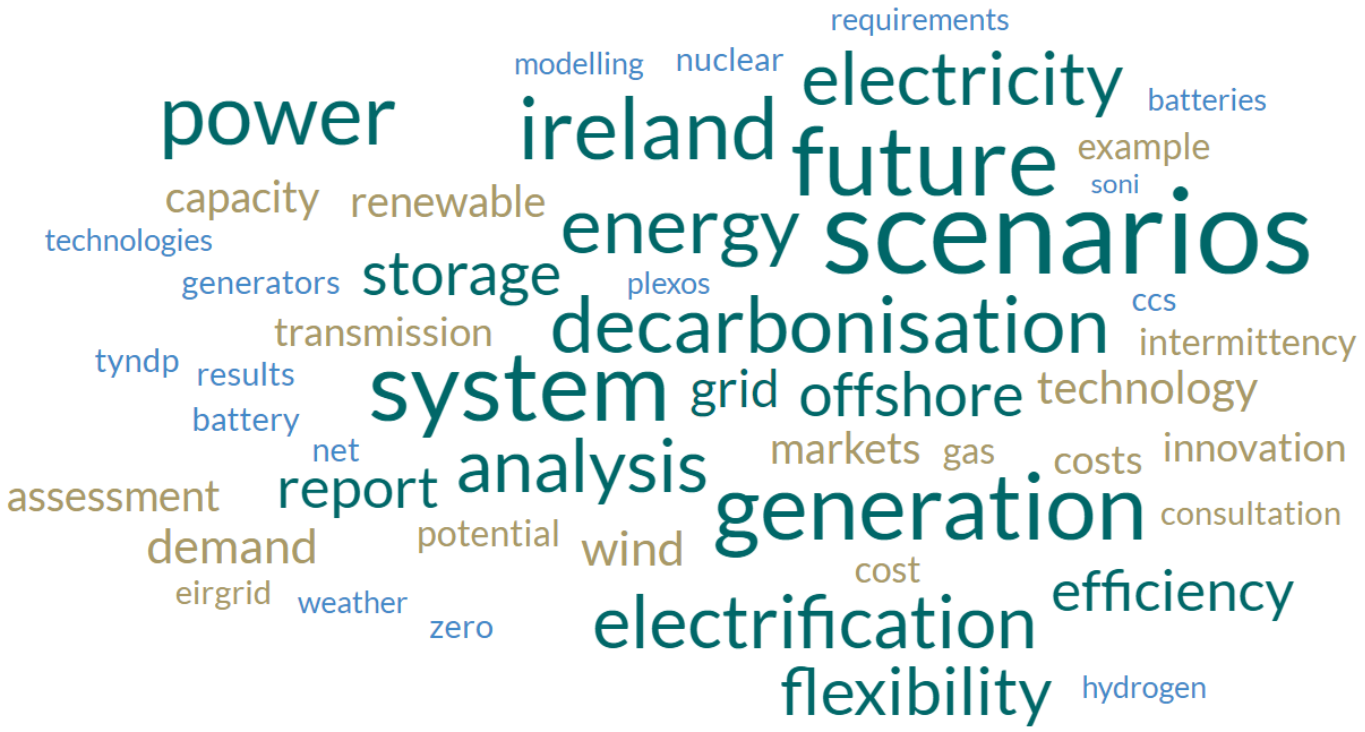
Tomorrow's Energy Scenarios 2023
Consultation Feedback

In development of TES EirGrid and SONI received great support stakeholders across the energy sector and TES 2023 public consultation was held in autumn 2023

38 consultation responses received from System Operators, Academia, Industry associations and developers

Key points of feedback included:

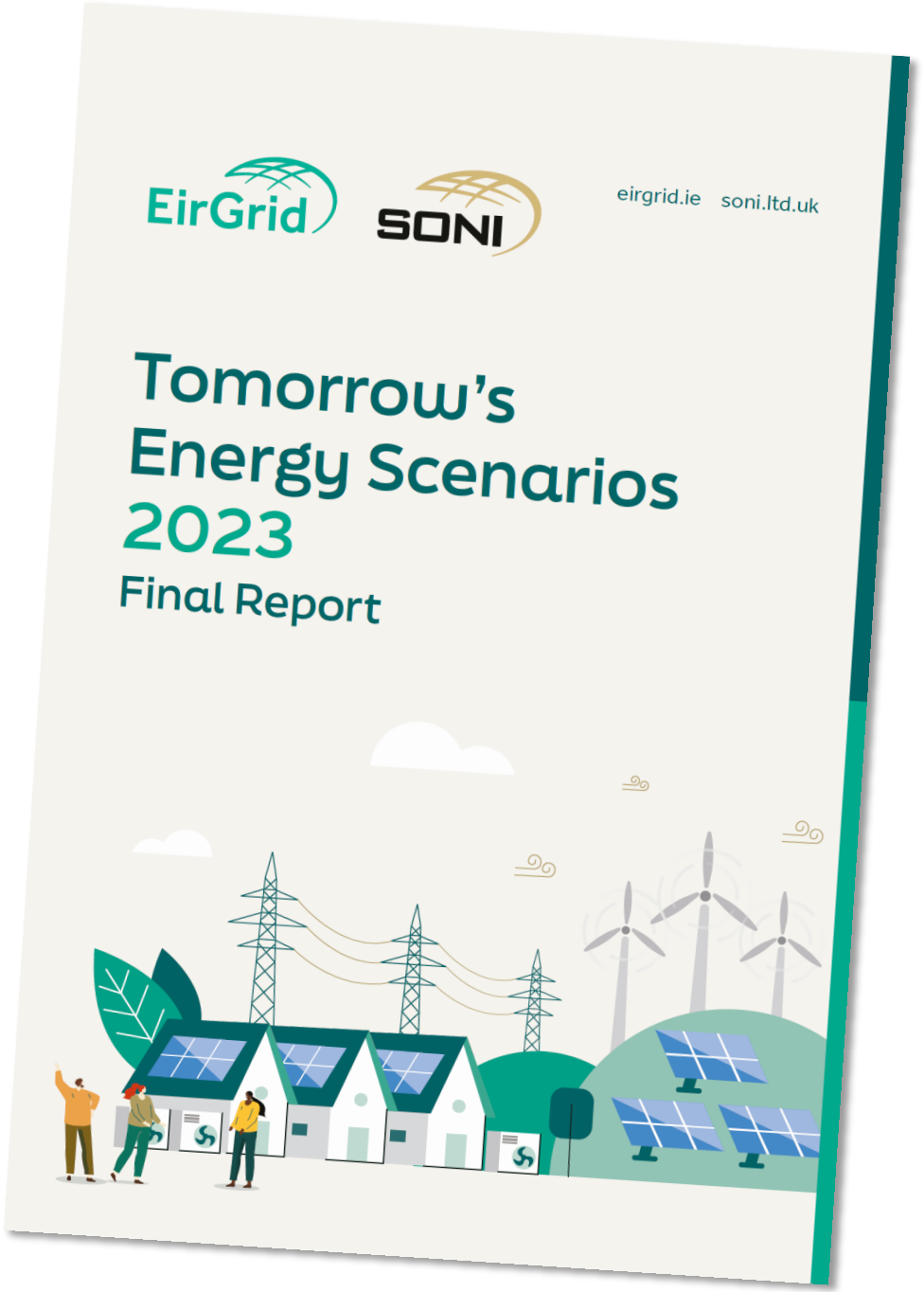
- Support for decarbonisation of the power system
- Pace of energy transition
- Technologies to address VRES intermittency
- Consideration of whole energy system



Tomorrow’s Energy Scenarios

Tomorrow’s Energy Scenarios 2023 goes beyond Shaping our Electricity Future v1.1 to explore a fully decarbonised power system for Ireland and Northern Ireland

Full report and supporting documents published on EirGrid and SONI websites:



Tomorrow's Energy Scenarios 2023

Post-Consultation Modelling Updates

Seek to address consultation feedback where we can

- Electricity demand profile adjusted to better reflect seasonality of heat pump demand
- Assumptions for CCS plant adjusted to show carbon capture rates up to 90%
- Develop our modelling to analyse for hydrogen supply, storage and demand

Scenarios

- 4 base scenarios reassessed targeting net zero power system from 2040-2050
- 2 sensitivities also assessed targeting a net zero power system from 2035 (Self-Sustaining 2035, Offshore Opportunity 2035)

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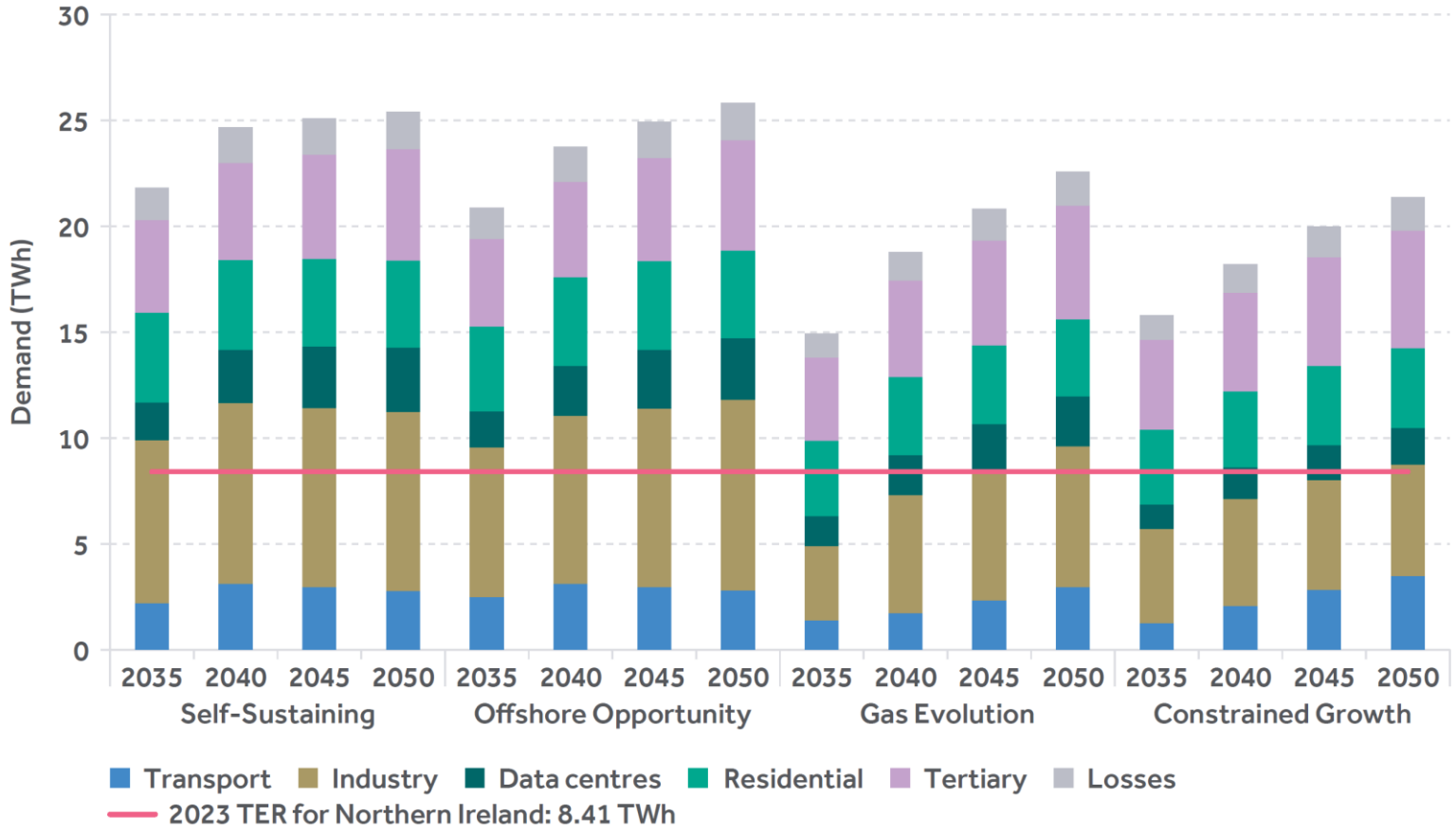
Total Electricity Requirement in Northern Ireland (TER)

Electricity Demand is expected to grow

Our analysis shows electricity demand more than doubling from current levels by 2050 due to the transition away from fossil fuels in all sectors. This should lead to a reduction of primary energy demand and overall increase in efficiency through electrification.

Increasing Need for Efficiency and Demand Flexibility

In a high VRES power system, demand will need to follow generation so measures to improve energy efficiency and demand flexibility will be vital to manage peak loads.



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Electricity Generation

A balanced portfolio of generation supported by energy storage and interconnection

- A large and rapid rollout of renewable generation capacity, particularly offshore wind as well as utility-scale and domestic solar PV
- Significant increases in electricity interconnection to continental Europe and GB
- A massive growth of energy storage capacity, including short, medium and long duration batteries
- The acceleration of green fuels (hydrogen, biomass & biomethane) to offer reliability to the power system
- Negative emissions technologies to capture and store carbon and balance emissions from unabated generators

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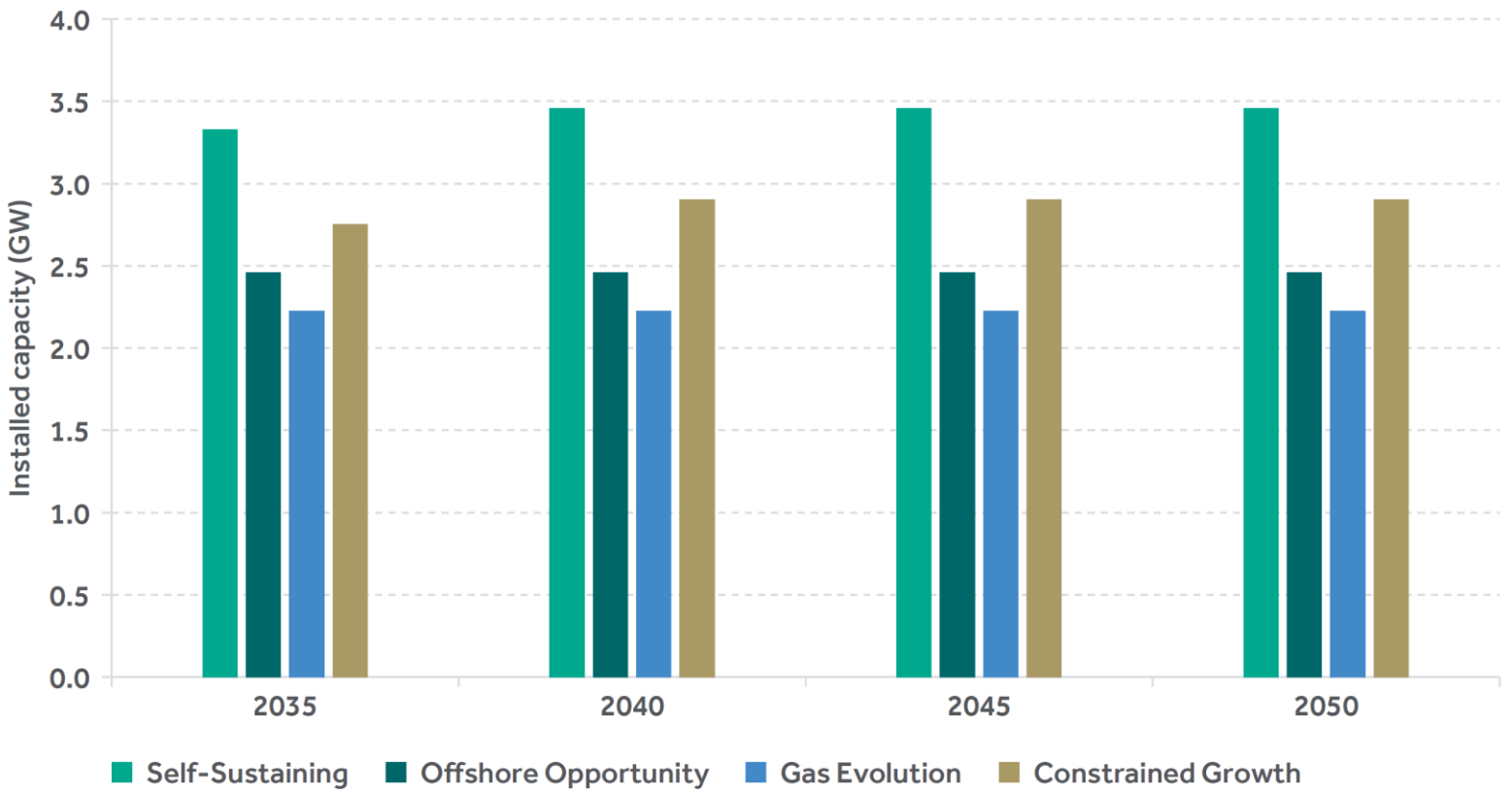
Installed Capacity - Onshore Wind Northern Ireland



- SS scenario builds 3.4GW total onshore wind capacity.
- For 2035, the installed onshore wind capacity for OO and GE scenarios increases to 2.4GW and 2.3GW respectively, and no further onshore wind capacity is built.
- CG starts with onshore wind capacity of 2.4GW in 2030 and builds a total of 2.8GW from 2035-2050.
- NI onshore capacity limit included in model of 3.4GW, primarily due to spatial constraints

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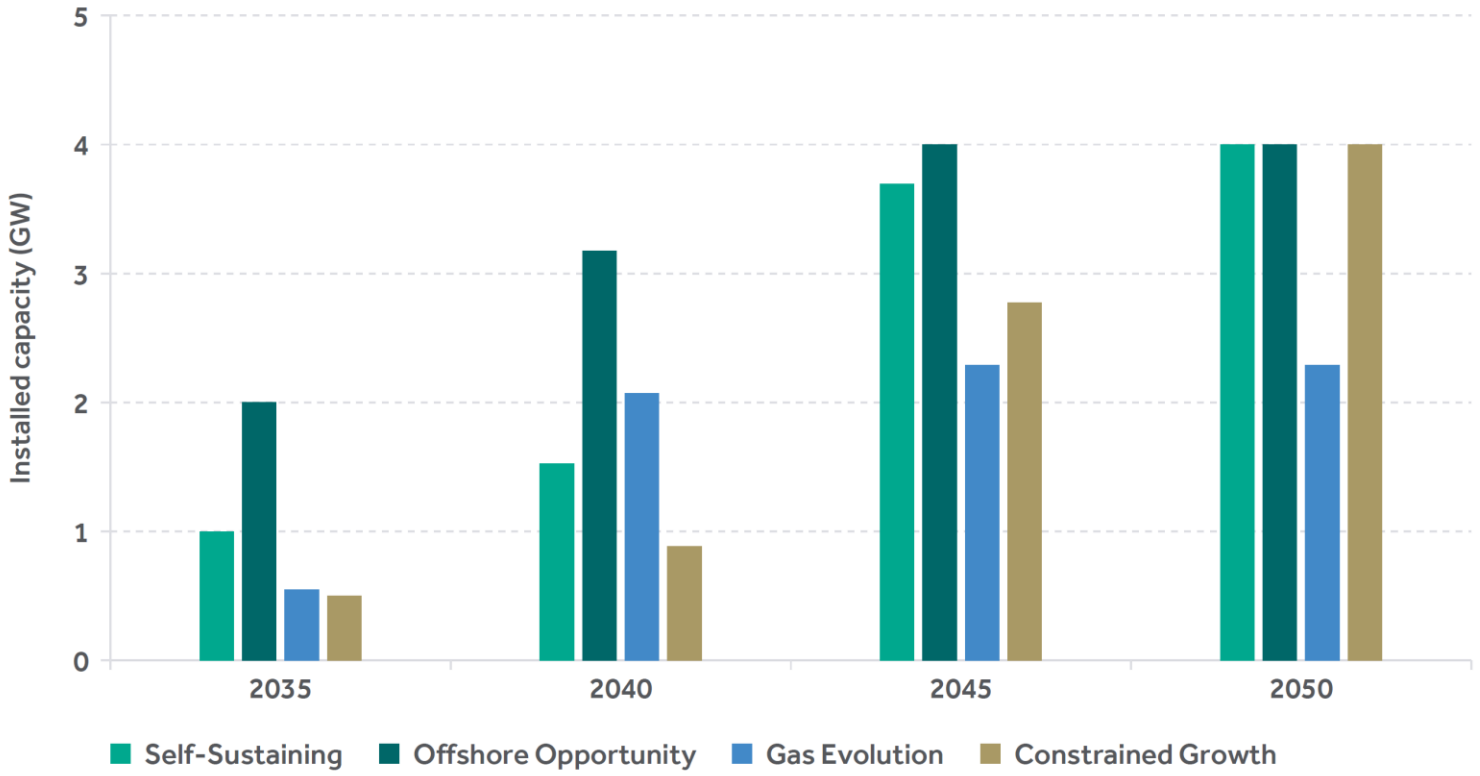
Installed Capacity - Offshore Wind Northern Ireland



- SS has a gradual growth in offshore wind capacity, increasing from 1.5GW in 2040 to 3.6GW in 2045, and 4GW in 2050.
- OO has a gradual increase in offshore wind capacity.
- GE scenario had a reduced amount of offshore wind capacity build, moving to a total of 2.3GW by 2050
- CG scenario also has a gradual increase in the offshore capacity build, starting at 0.8GW in 2040 and building up to 4GW in 2050
- NI offshore capacity limit included in model of 4GW, primarily due to spatial constraints

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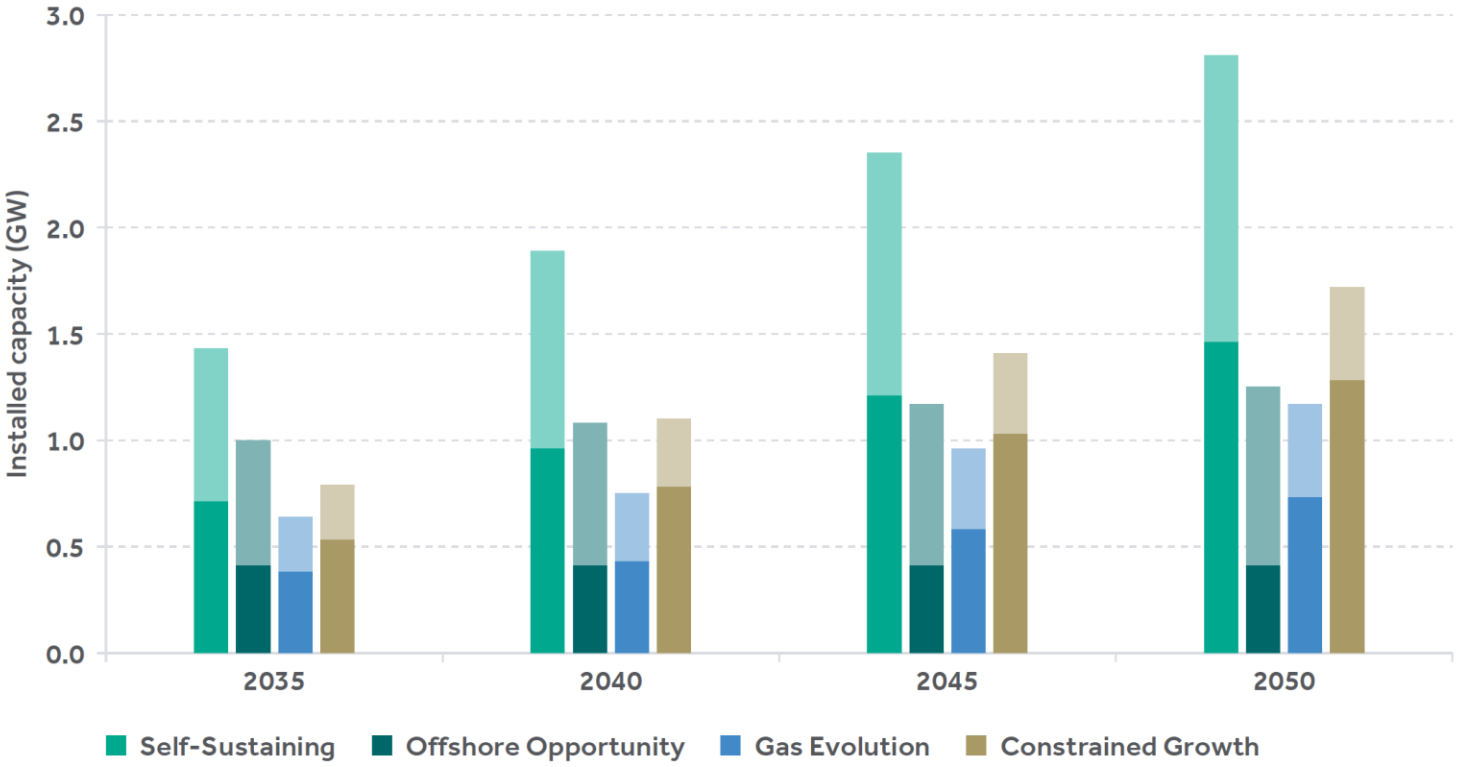
Installed Capacity – Solar PV Northern Ireland



- All scenarios have a gradual build out of solar capacity between 2030 and 2050
- SS starts with 0.8GW in 2030 and builds to 2.8GW in 2050
- OO also starts with 0.8GW in 2030 but builds a lower amount of solar capacity, reaching a total capacity of 1.3GW in 2050
- GE and CG begin with 0.4GW of solar capacity in 2030
- GE builds a total capacity of 1.2GW while CG builds up to 1.8GW in 2050
- Hatching denotes Micro Solar PV

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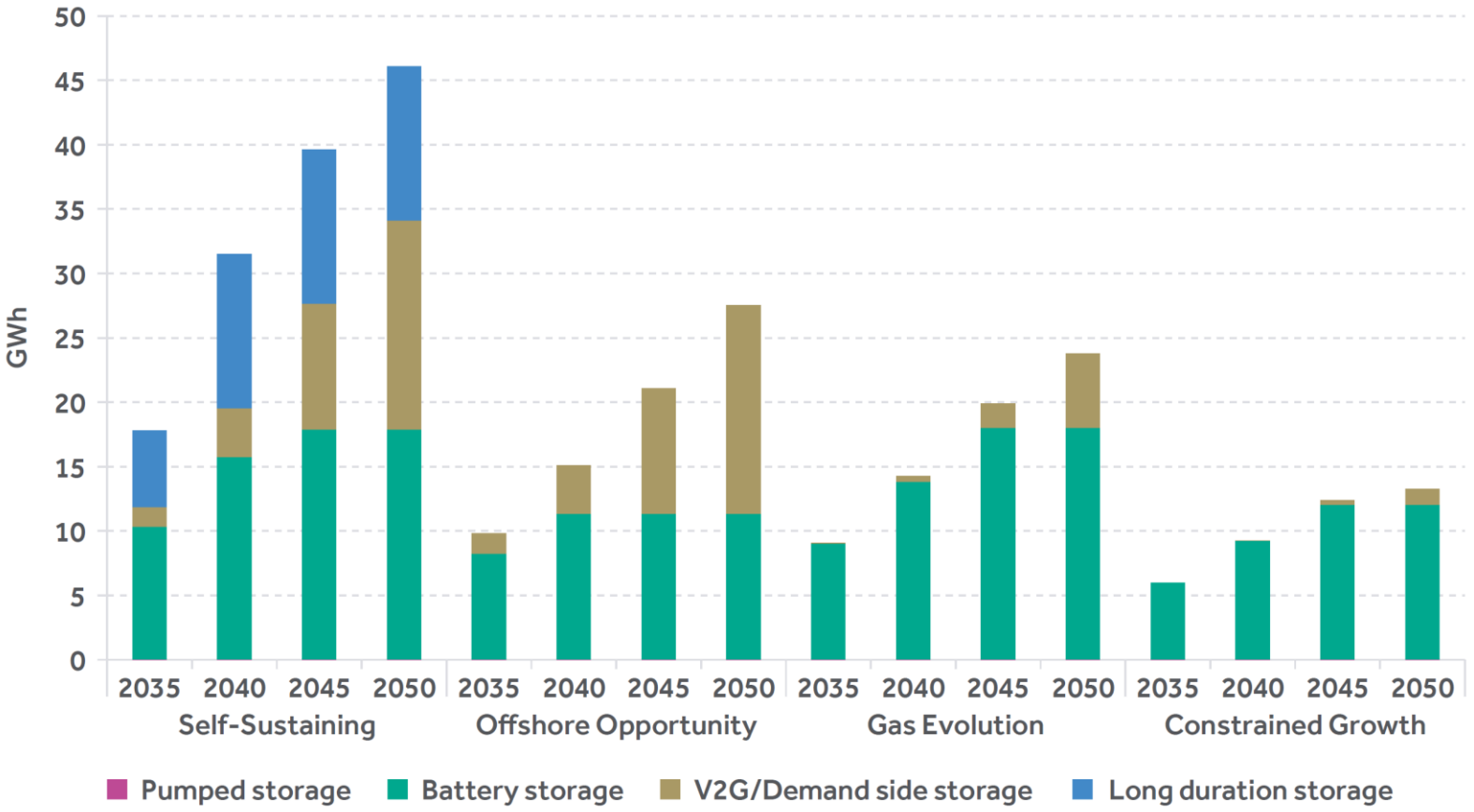
Installed Capacity - Energy Storage in Batteries Northern Ireland



- Energy storage is critical to enabling high levels of renewable penetration
- The model post-consultation shows a 5GWh increase in energy storage build-out up to 2050
- The total battery capacity is a combination of 2hr, 4hr, 6hr, 8hr batteries as well as Vehicle to Grid (V2G) and other demand side storage
- Self-Sustaining has highest battery build including 100-hour long duration batteries

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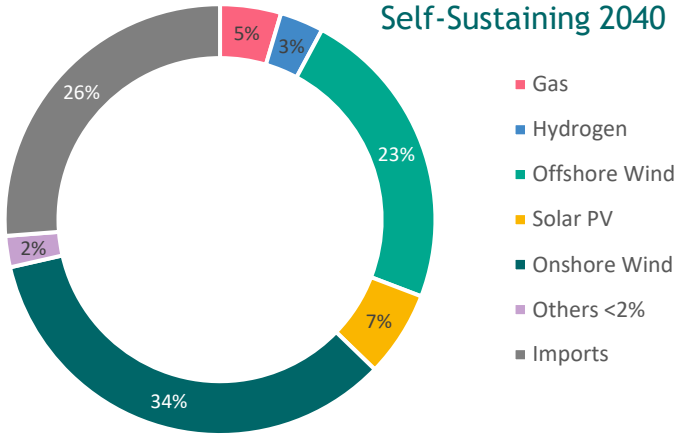
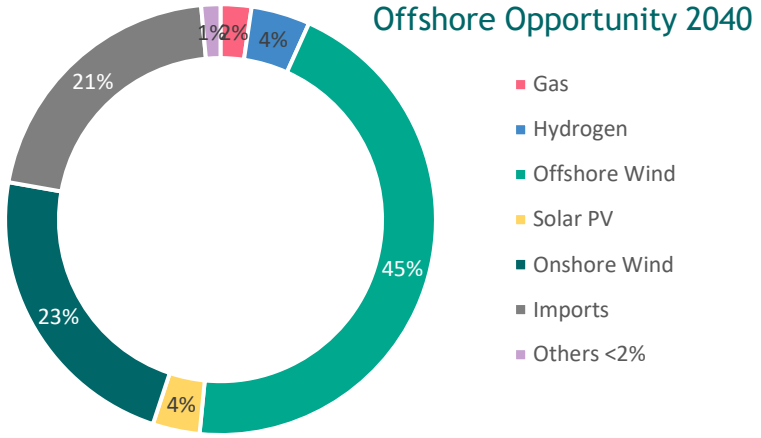
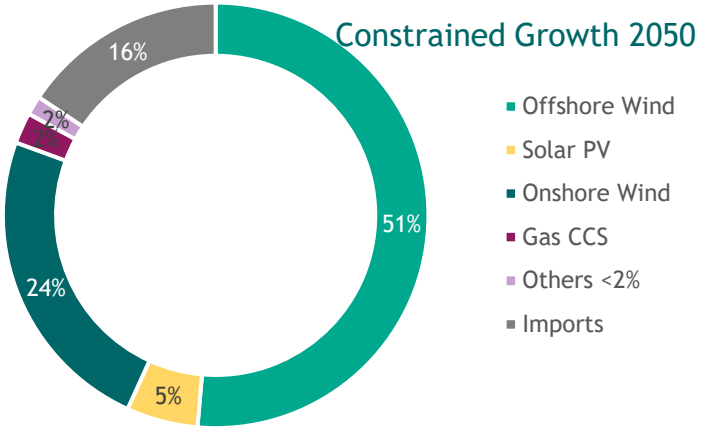
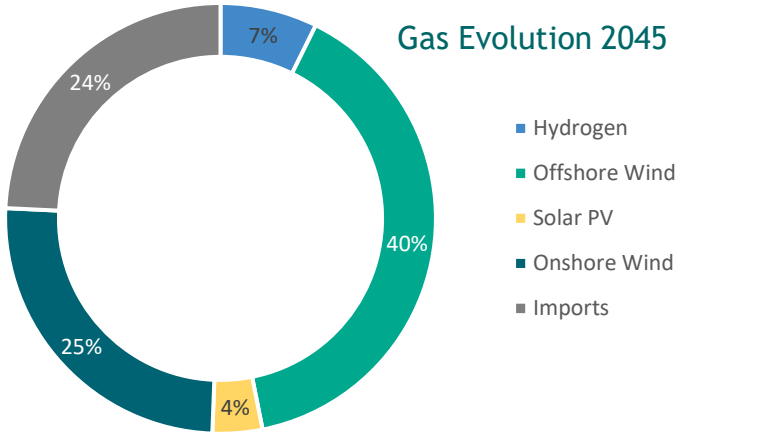
Generation Energy Mix Northern Ireland (Net Zero)









- VRES-E is between 60%-70% of mix (TWh) in 2040
- The reduction in VRES-E comes from a higher percentage of interconnector imports in the GE scenario
- The scenarios now show a more consistent high RES-E generation

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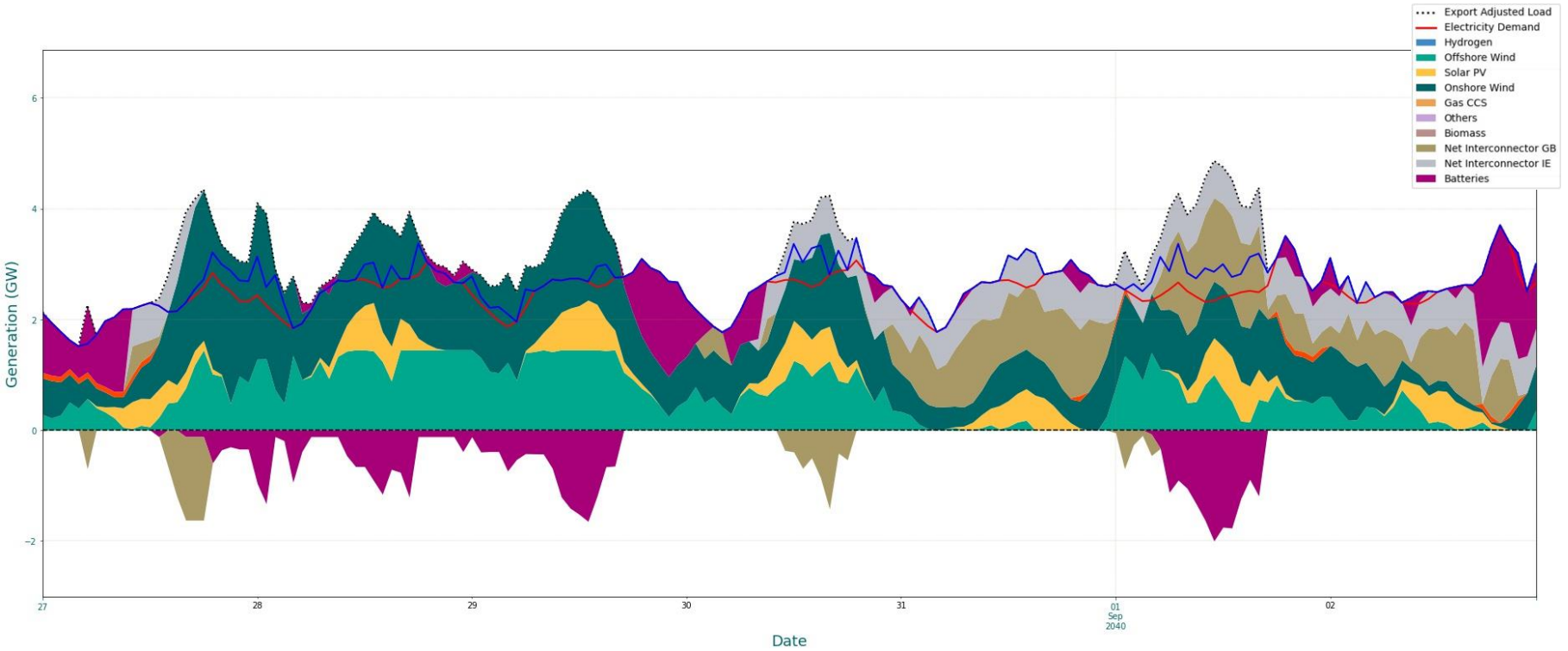
Self-Sustaining, Weekly Generation 2040

High Wind Summer Week



- Self-Sustaining shows Net Zero power system from 2040
- Late summer week with good wind and solar generation
- VRES largely meeting demand and supporting charging of batteries
- Gaps in renewable generation mitigated through IE and GB imports and battery dispatch

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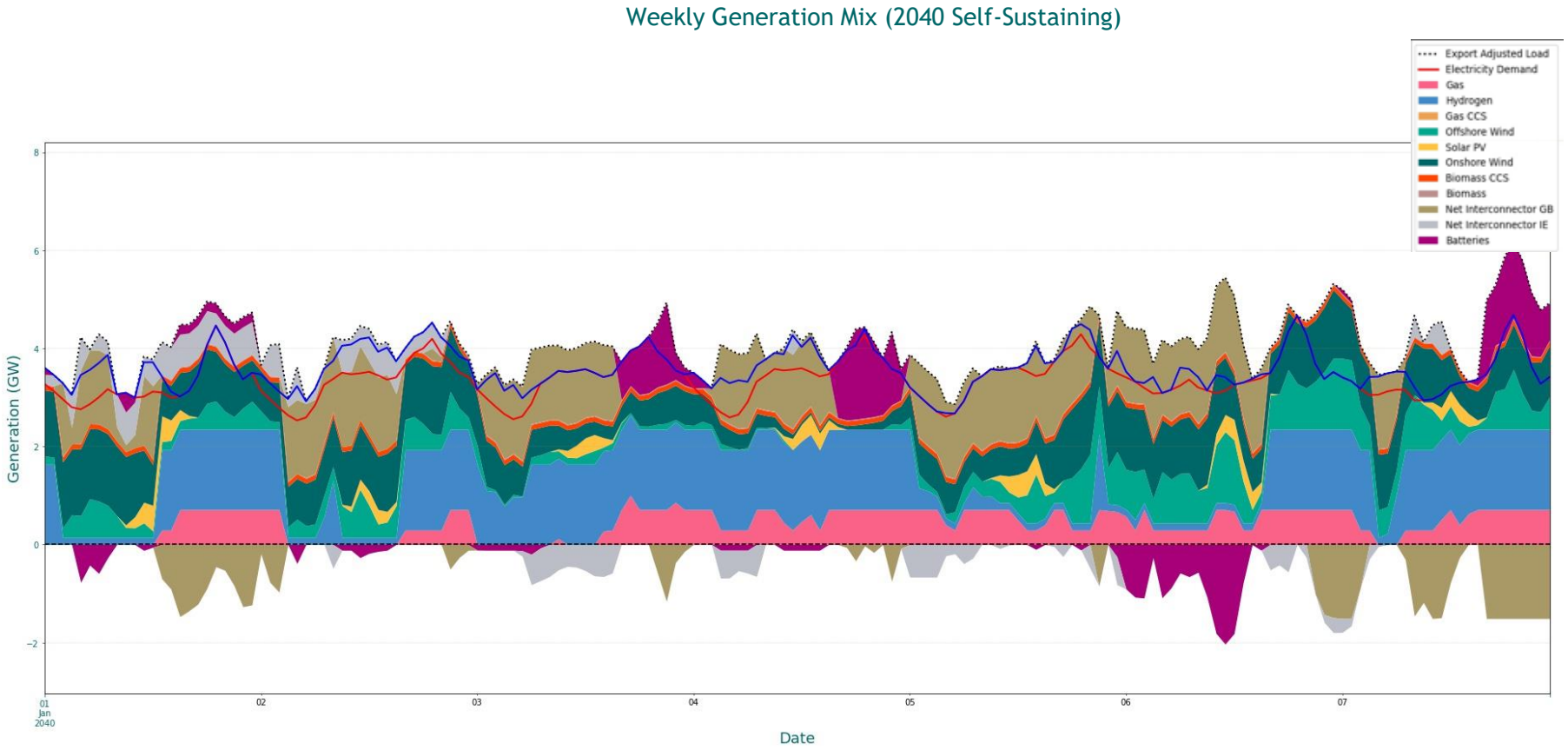
Self-Sustaining, Weekly Generation 2040

Low VRES period - winter



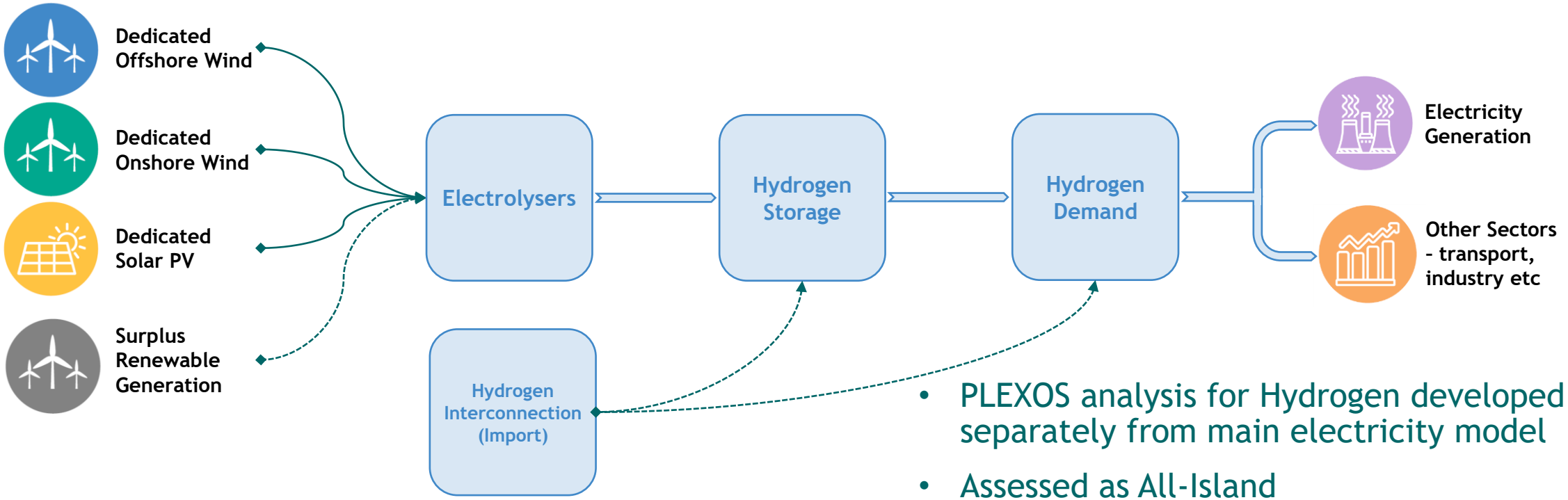
- Self-Sustaining shows Net Zero power system from 2040
- Low-RES period, when renewable generation is low, dispatchable generation plays an important role (Gas, Hydrogen, BECCS)
- Electricity imports from GB and Ireland

Tomorrow's Energy Scenarios 2023

Assessing future Green Hydrogen

Decarbonised power supply

Demand for Green Hydrogen



- PLEXOS analysis for Hydrogen developed separately from main electricity model
- Assessed as All-Island
- Methodology and key assumptions developed in dialogue with GNI & Mutual

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Post-2030 Network Planning

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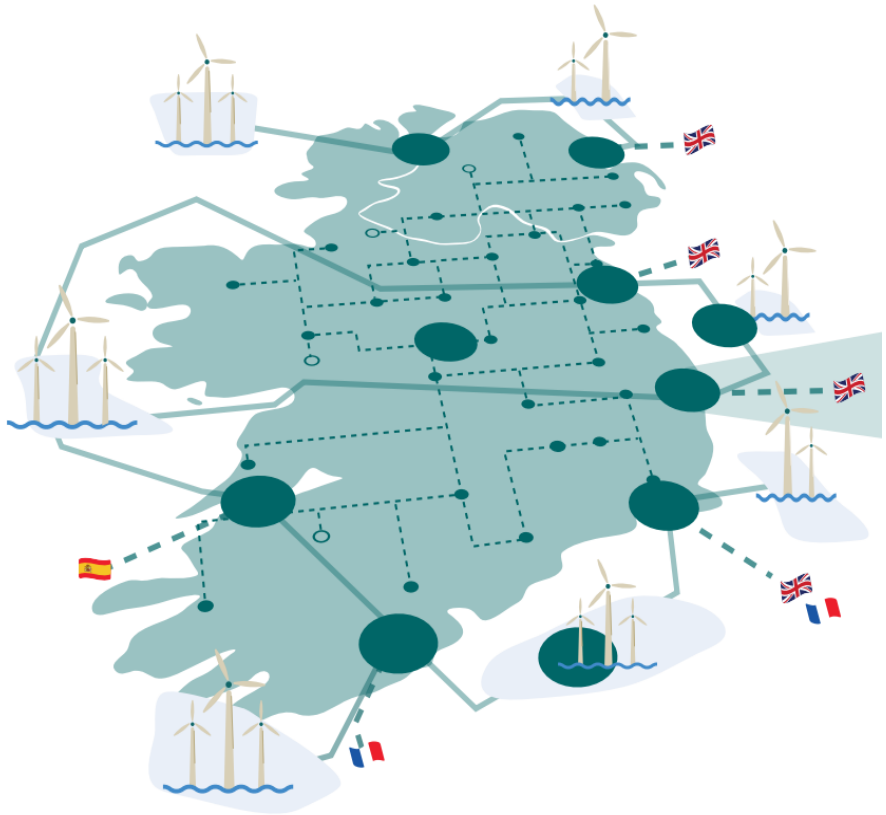
A holistic decarbonised network vision for beyond 2030…

…determine the optimum onshore and offshore transmission network



KEY INPUTS:

- ONDP
- RES-E Targets
- DMAPS
- Gov OTS
- TES & TESNA

FLEXIBLE DEMAND:

- LEUs
- Industrial Growth
- Electrification
- Carbon Targets
- H2, Agri-food etc..

NETWORK DESIGNS:

- Optioneering
- Infrastructure needed to support RES-E

TECHNOLOGIES:

- System Services
- Storage
- BECCS
- Flexible Network Devices
- HVDC

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Discussion

Given the challenges of decarbonization and electrification do we need to define a new way to strategically plan the infrastructure we need for our long term objectives?

What should a future vision of the transmission network include?:

- A net zero electricity system
- Maximum electrification of demand
- Targets for Renewable build out and system flexibility (storage, interconnection, hydrogen)
- Negative emissions
- Common planning assumptions across system operators

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SOEF Advisory Council Meeting #8

Grid Delivery in NI to 2030

- *Rónán Davison-Kernan*
- *Gareth Brown*

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NI Networks
Improving Grid Delivery for 2030

Connections Policy

- **Connections Policy** and **Transmission Connection Charging Statement (TCCMS):**
  - Updating to improve efficiency of offer process and protect earlier stage network development projects to allow for more coordinated, efficient and economic development of the transmission system
  - Finalising proposed improvements and will issue both for consultation in June
- **Firm Access Quantity (FAQ) Process**
  - Current FAQ process is from 2013 and needs updated
  - Developed a draft paper internally on proposed changes to our methodology and we plan to workshop with NIE Networks, industry and the UR in coming weeks
  - Technology-specific assumptions, unlocking more capacity for solar and storage
  - Looking to anticipatory investment for the connection of renewable generation to the transmission system

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Transmission Clusters

- Most renewable connections to date have been distribution – likely to be more of transmission scale in future
- Existing distribution cluster policy has been very successful – 800+ MW
- **Current connections policy needs to change to allow more proactive network development** - need a transmission policy to match successful distribution cluster policy
- Draft policy has been developed and has been shared with NIE Networks
- Next step (May/June) - workshop with industry then UR

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Storage & Low Carbon Sources of Inertia (LCIS)

- **Contracts awarded** to two Synchronous Condenser projects in NI – now progressing through preconstruction
- Key to achieving our renewable ambition and reducing curtailment of renewable generation Significant pipeline of battery storage projects in development (short duration)
  - >1 GW in planning
  - 425 MW in connection process
  - >2 GW total in development
- Batteries can be used to reduce constraints, act as “virtual lines” and for voltage support
- Recent SONI/EirGrid Call for Evidence on Long Duration Energy Storage – key to high renewables uptake

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Line Rating Working Group

- New approaches to use of existing assets will help increase network utilisation
- New working group set up with NIE Networks to explore Dynamic Line Rating (DLR) and other approaches to circuit rating
- Operational & market integration are key challenges
- Magherakeel – Omagh DLR is primary focus, but opportunities exist across the system

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Other Activities

- Ongoing engagement with UR on use of Easements v/wayleaves for new OHL
- Working with DfE/Aurora Research on RESS High Level Design
- Participation in DfE 80 x 30 group
- Grid Acceleration Project

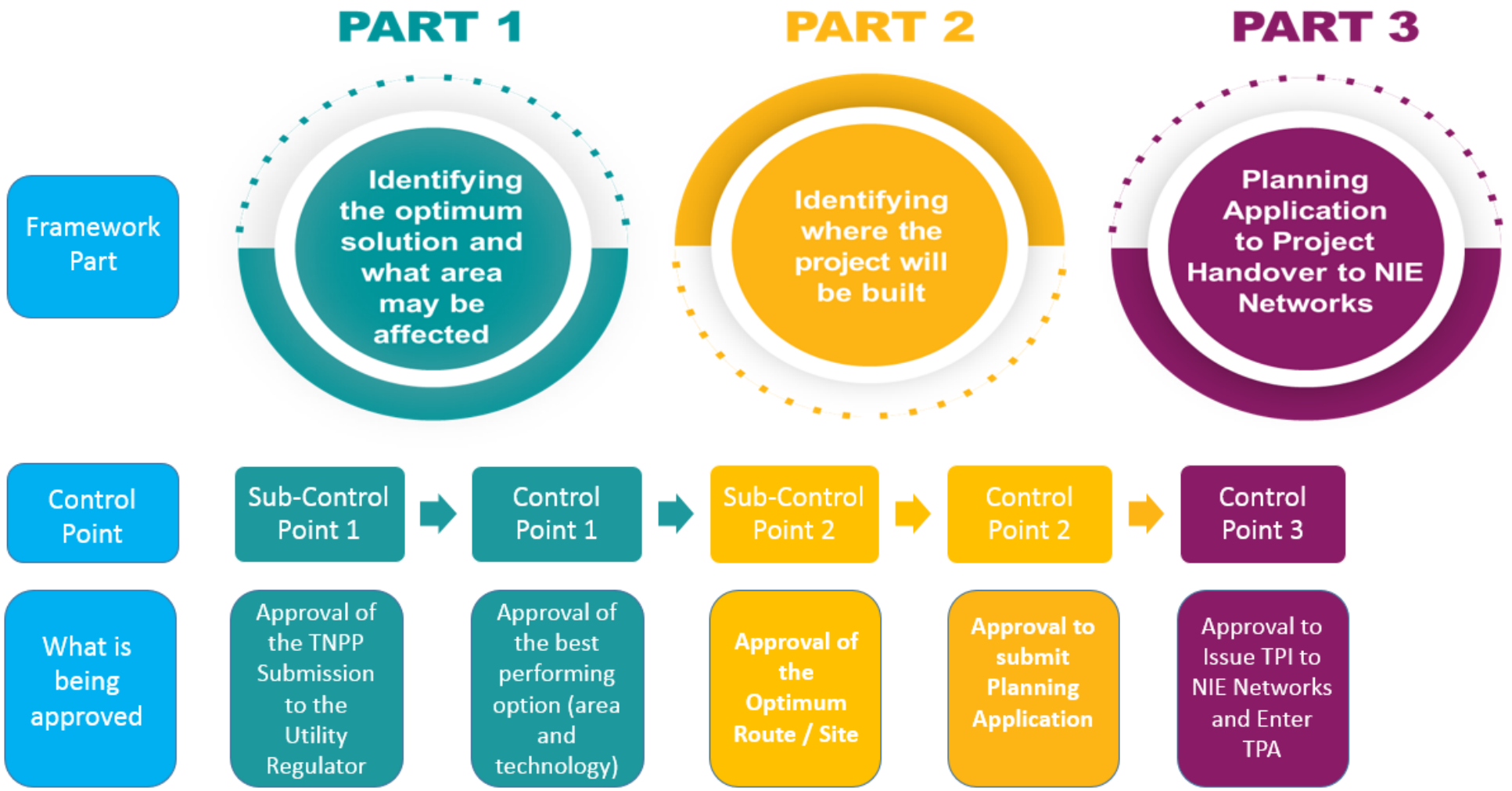
Project Acceleration

SOEF Advisory Council Presentation

Context

- Less than 6 years until 2030 – meeting targets hugely challenging
- Needs to increase pace at a whole system level
- Industry stakeholders – lack of grid capacity and connections timescales
- Nick Winser report – GB report into acceleration
- Key TSO challenges and external dependencies – licence constraints, public/landowner opposition, TO-TSO interface, skills and resources, timely regulatory approval, land consents
- Recognises urgency – business as usual won't be enough
- Narrative will move to acceleration and accountability

SONI's Grid Development Process – An Overview



Project specification

- **SCOPE:** review and developed revised “end-to-end” process – areas within SONI’s control
- Detailed mapping and audit of existing SONI practice and impacts on transmission network development and key internal and external dependencies;
- Identification of new ideas to accelerate critical transmission network development workstreams and shorten project timescales;
- Identification of opportunities to reform existing practice to reduce project timescales and potential unnecessary;
- A fundamental change to the “business as usual” approach.

Approach – Winser report methodology

- Map and audit existing processes against 3 Part Process
  - Existing practice and estimated timescales
  - Internal and external dependencies
  - Identification of key themes
- Audit existing process to identify opportunities to accelerate
  - Identify options for change including engagement with relevant internal/external dependencies
  - Impact and risk assessment of options
- Develop revised end-to-end process

Key activity

- Initial mapping workshops –March
  - Mapping existing practice and identification of key themes
- Audit workshops – Assessing existing practice
  - Identification and assessment of potential options for change
  - Assessment of internal and external dependencies
- Validation workshops – April/May
- Development of revised end-to-end process – April/May
- External/Internal dependency workshops – May/June
  - Discuss mitigations with internal and external partners

Key assumptions

- Existing regulatory approach
- Adequate internal resources and optimal operating model
- Scope for external change e.g. planning reform, compensation
- Hypothetical project – Substation and overhead line e.g. Mid Antrim Upgrade
- 18 months for planning approval
- 75% necessary wayleaves required

Project Update

- Validation phase
- Approx 28 options for change, 18 options directly within SONI's control
- Opportunities for significant time savings if we work differently
- Thematic areas include:
  - Working at risk
  - Agreed design principles
  - Project management approach in SONI Part 1
  - Consolidated optioneering process
  - Introducing competition/incentives for external contractors
  - Developing consolidated interface points and earlier involvement with NIE Networks – Part 1 project charter
  - Timely regulatory approval
  - Planning reform
  - Compensation/Easements for land access

Next steps

- Final validation workshops
- Development of final list of recommendations
- Development of key asks – external dependencies
- Development of consolidated timeline
- Bridging project with NIE Networks
- Publication

Discussion

SOEF Advisory Council Meeting #8

Lunch – 40 minutes

SOEF Advisory Council Meeting #8

Members Discussion: What Makes a Consultation Process Effective?

- *Jag Basi*

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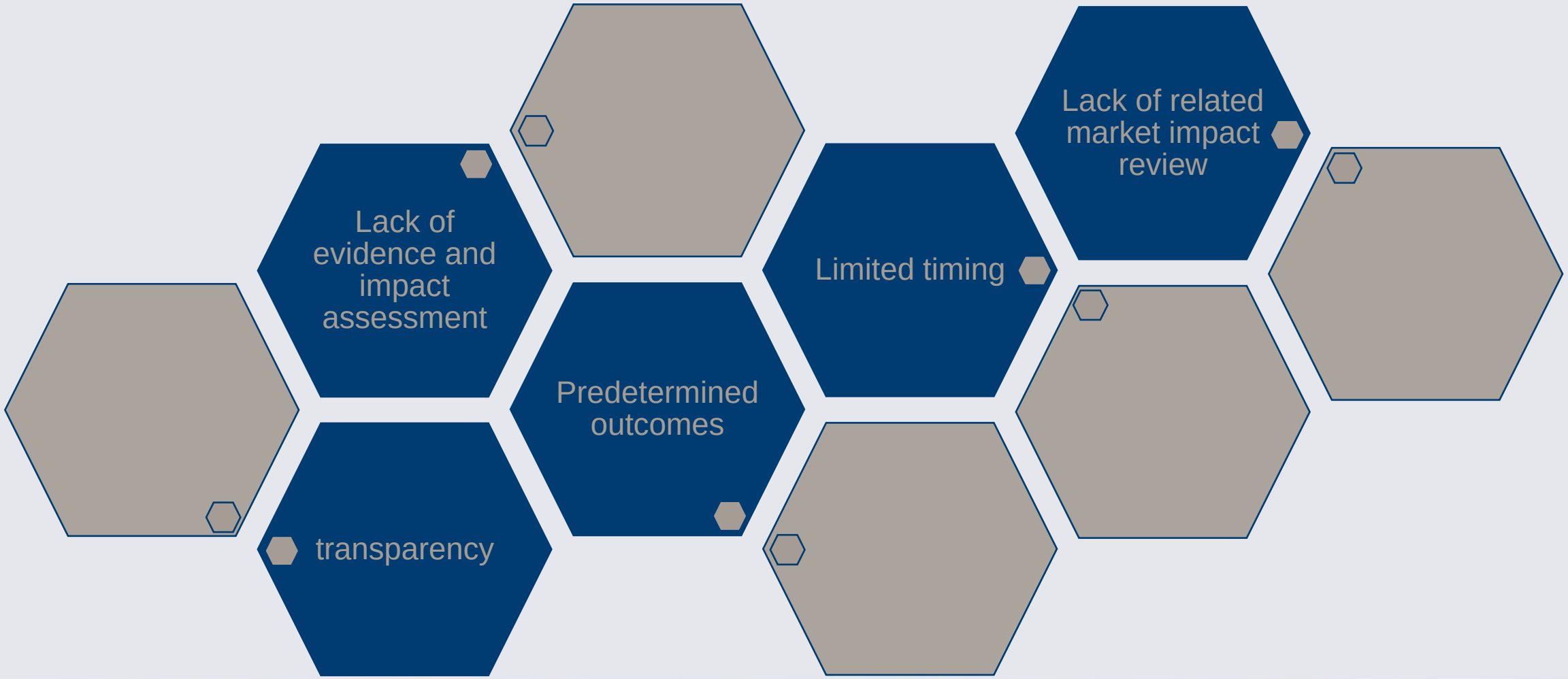
ELECTRICITY ASSOCIATION OF IRELAND

WHAT MAKES A CONSULTATION PROCESS EFFECTIVE?

A decarbonised future powered by electricity

What are the main issues with current consultation processes?



What does good consultation look like?

Transparency, Accountability:

1. Clear objectives and goals.
2. Transparency of the process
3. Openly documenting the process;
4. Clear evidence sharing;
5. Explaining the underlying rationale of the outcome;
6. Publishing all (non-confidential) submissions.
7. Accountability to other actors for instance, the CRU and Oireachtas;

Stakeholder Engagement

1. Updating stakeholders(as defined in process) through (defined) communication channels;
2. Be clear what is the role and expectation of the stakeholders is clearly defined
3. Communicate any alternations.
4. Provide opportunities to share opinions;
5. Allow collaboration through seminars, surveys, opinion polls
6. Inform stakeholders how their comments have been assessed and the outcome
7. Time for responses should take into account

Key Points

CRU's consultation is usually Transparent with good Stakeholder Engagement -it implements, consistent, transparent strategy, provides feedback, explaining where/ whether comments have been taken on board.

Gov IE highlights the importance of Transparency, as it notes that consultations must be timely, balanced, clear and openly shared, and with clear outcomes.

Ofgem gives stake-holders opportunity to make proposals for change and uses seminars, meetings, surveys, opinion polls effectively. It also makes good use of Regulatory Impact Assessments

ACER shows the importance of Accountability, by being clear and open on the process, evidence sharing, publishing all (non-confidential) submissions.

EC highlights Transparency , as well as, the importance of stakeholders, by consistently updating stakeholders, being clear on the objectives and the rationale for change.

Proposed Consultation Process :

Identifying Issue (engagements)

Early stages: Agree what are the objectives with the stakeholders, so that they understand the purpose & ensure that the right problem is being assessed, and enough time is being given.

Identifying the objectives of consultation will help determine who should be consulted, how and when. Therefore, objectives of the consultation should be clear, and be set out as well as the context for them.

Look at the alternatives from desk-based research

Crucial to consider an appropriate number of alternatives. Allow collaboration, bring people on board and make a co-created solutions space. No self-select.

Assess with data and impact (negative/positive)

Assess the risks, such as,
financial, regulatory and strategic risks.

Engage with industry on risk

Share all solutions and let industry determine the RAG status, given the data presented and unpack the analysis.

Consultation

A consultation, which allows industry to address alternative, as well as to rank them.

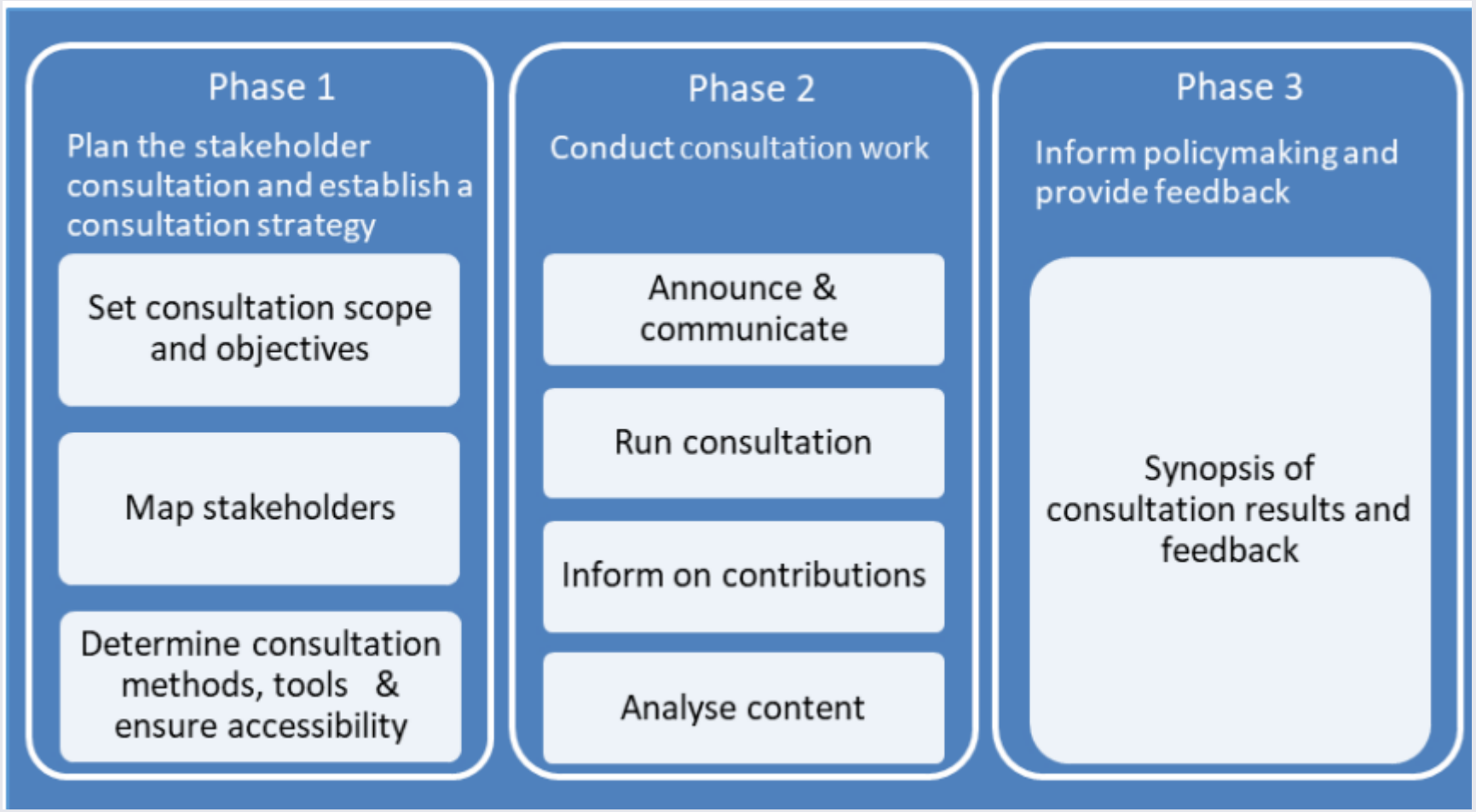
clear and realistic timeframes for input. The duration is decided case-by-case, depending on the complexity of the issue

- TRANSPARENCY
- EFFECTIVE ENGAGEMENT
- IMPACT REVIEW
- FULL SPECTRUM OF SOLUTIONS
- TRANSPARENT DECISION MAKING

Benefits of the Approach and how they address the issues:

ELECTRICITY ASSOCIATION OF IRELAND

Key steps in the consultation process



SOEF Advisory Council Meeting #8

Coffee Break – 15 minutes

SOEF Advisory Council Meeting #8

Discussion Topic: HV Interface Forum

- *Louise O'Flanagan*

EirGrid SONI

21/05/2024

HV Forum Update

Shaping Our Electricity Future – Advisory Council

Key Enabler: Roads

- HV Interface Forum well-established
- Cooperation Agreement in place (EirGrid, ESB, DECC, CRU, TII, CCMA & DoT)
- Supported by five working groups:
    1. WG1 – North Connacht
    2. WG2 – Transitional Projects
    3. WG3 – Engagement Framework
    4. WG4 – Costs & Liabilities
    5. WG5 – Enduring Standards & Protocols
- Progress made in all Working Groups and engagement is ongoing.

(cont.)

EirGrid SONI EirGrid CRU An Coimisiún um Rialáil Fóntais Commission for Regulation of Utilities ESB NETWORKS CCMA Cumann Lucht Bainistíochta Contae agus Cathrach County and City Management Association An Roinn Iompair Department of Transport TII Bonneagar Iompair Éireann Transport Infrastructure Ireland An Roinn Comhshaoil, Aeráide agus Cumarsáide Department of the Environment, Climate and Communications

Summary

- **WG1 – North Connacht:** Pre-construction front end engineering design is advancing. Progress made with stakeholders such as quarries adjacent to the works.
- **WG2 – Transitional Projects:** March ’24: Planning submitted for CP1021 East Meath-North Dublin; and additional documents submitted for CP0966 Kildare-Meath following legislation change. Project preparation (incl. ground investigation) and landowner engagement ongoing.
- **WG3 – Pre-Planning Process:** 1st draft of Engagement Document submitted to HV Interface Forum and comments received. Ongoing discussions to identify synergies (e.g. greenways and advanced ducting) and mechanisms to capture these on an ongoing basis.
- **WG4 – Costs & Liabilities:** Terms of Reference agreed and Roads/Electricity sector discussions ongoing.
- **WG5 – Technical Standards:** Terms of Reference developed and Roads/Electricity sector discussions ongoing.

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Working Group 1 - North Connacht Project

WG1: North Connacht 110 kV

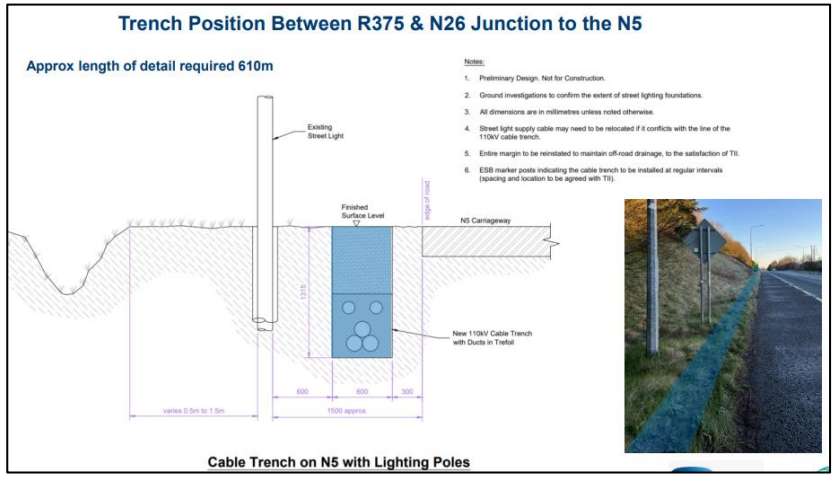
Project Details:

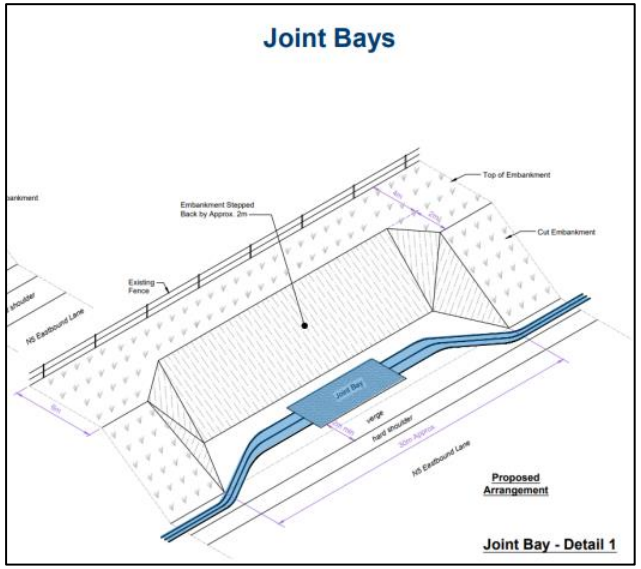
- New 110 kV Underground Cable circuit from Moy to Tonroe (approx. 58km).
- Redevelopment and extension of the existing Tonroe 110 kV substation.
- Planning consent granted Sept 2023.
- Project Handover to ESBN Dec 2023.

Roads Interaction:

- North Connacht project is the case project which brought about the requirement to establish the HV Interface Forum.
- The planning design was developed which routed the UGC & joint bays within the pavement/ carriageway of the existing National, local and regional road network.
- Issue was the UGC installed within the pavement of existing roads.
- Tasked with removing as much of the UGC from the pavement as possible.

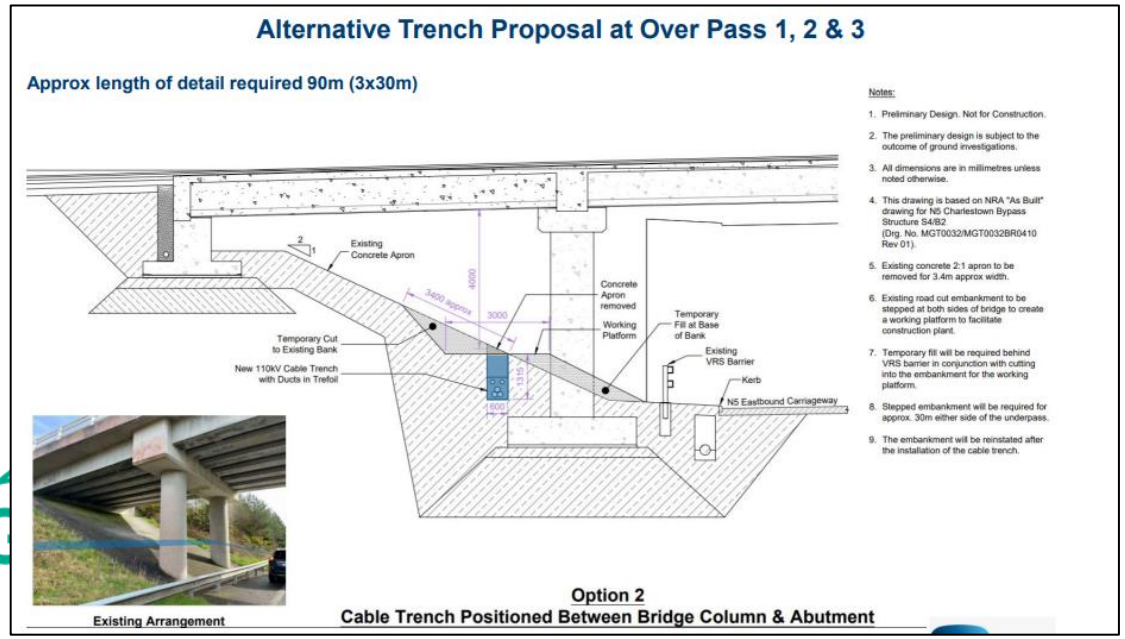
WG1: North Connacht 110 kV





Working in collaboration with the Roads Authorities:

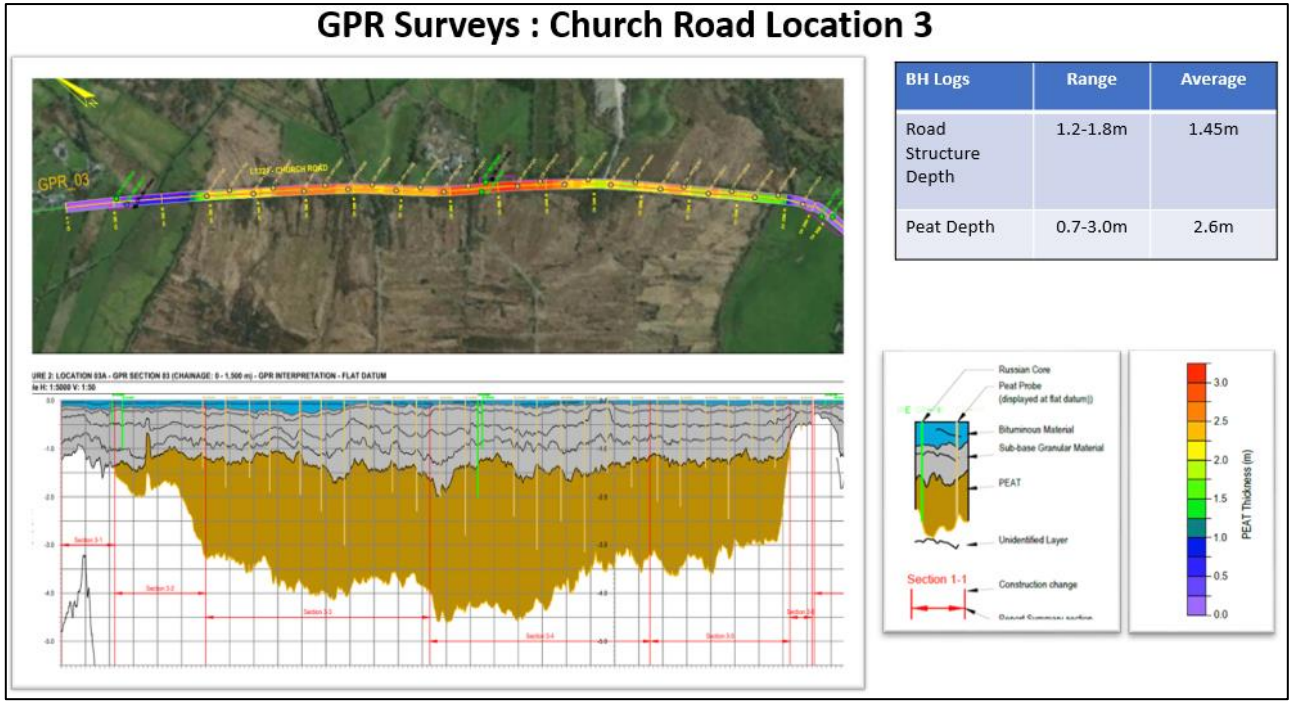
- Reduced number of joint bays in road pavement, reduced length of UGC in carriageway.
- Developed solutions & principles to install UGC and joint bays in road verge, crossing existing road structures, interaction with road furniture.
- Clash detection and design coordination with other services.



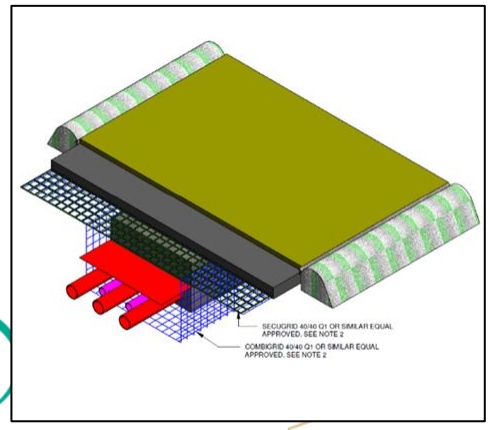
Realignment Project Overall Outputs Workshop 1-3

	Joint Bays		Trench	
	Total No	On Road	Trench In Road	Trench Off Road
Planning Design	79	65	53.4 km	5.6 km
Design Review	51	7	23km	36 km

WG1: North Connacht 110 kV

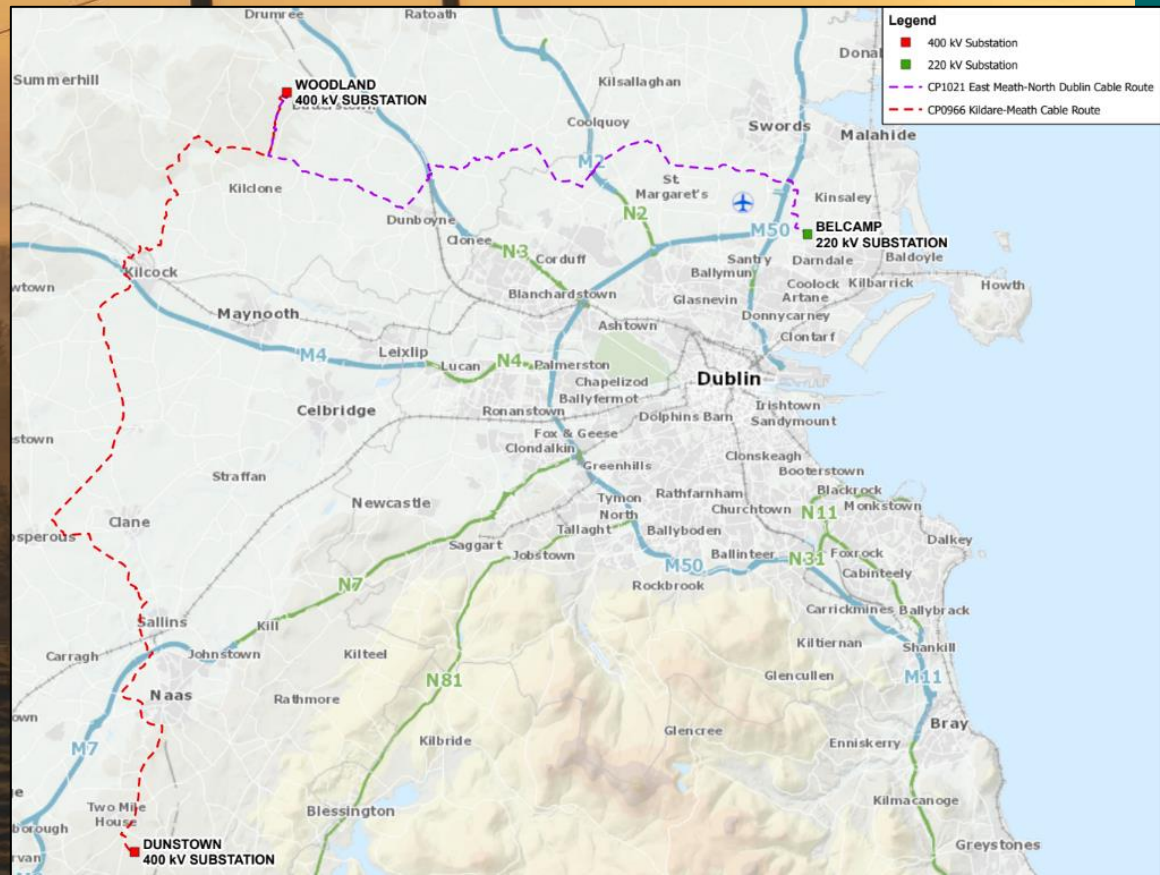


- Peat identified in approx. 7.5km of **regional road** and 600m section on **National road N26.**
- Depth range between 700mm to 3.0m.
- Regional road solution: Specific design with a Geotextile grid membrane solution being developed.
- National road solution was to HDD adjacent to N26 for a length of 600m to avoid disturbing peat on National road.



Working Group 2 - Transitional Projects

Kildare - Meath Project



WG2: Kildare Meath Project

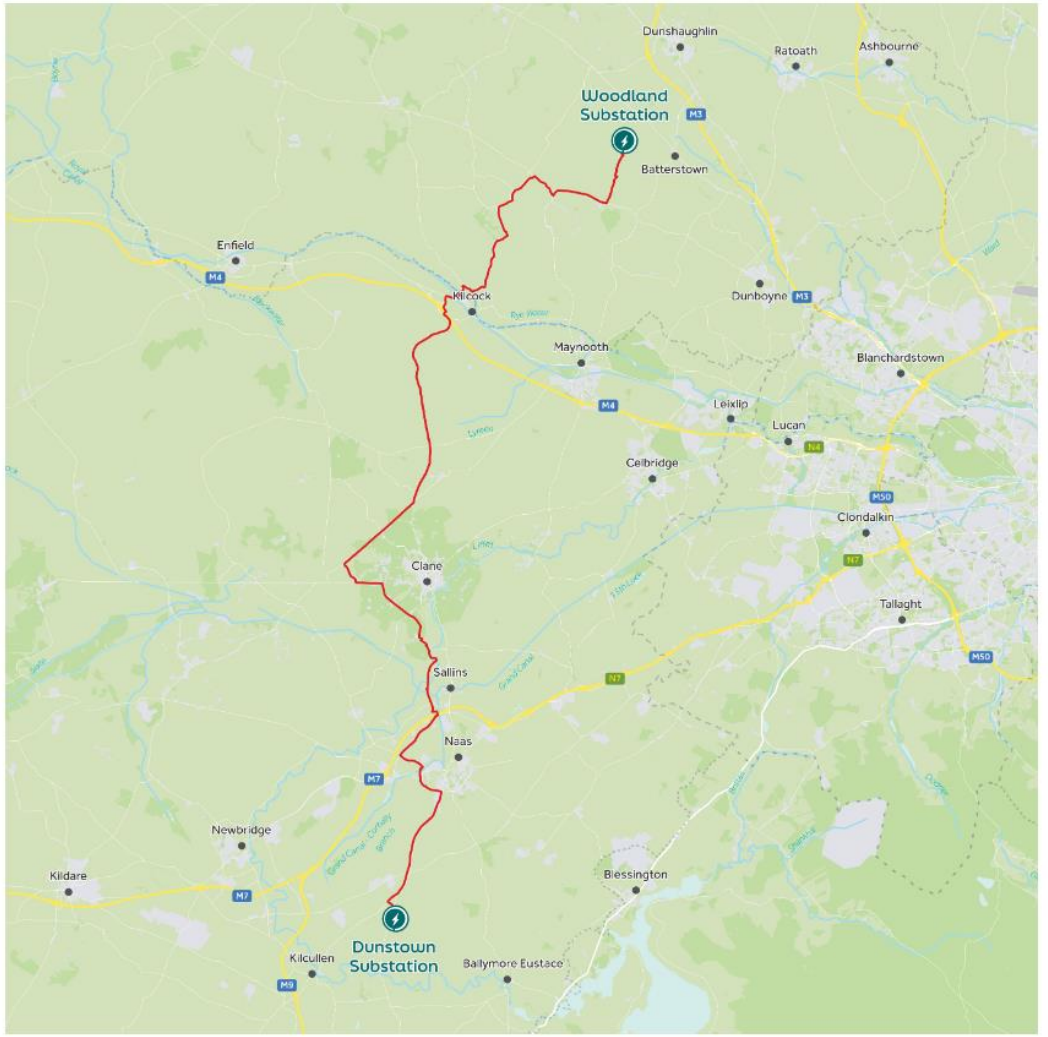
Project Details:
A new 400 kV UGC electricity transmission connection between the Woodland Substation in Meath and the Dunstown Substation in Kildare. The route is 53km with 43.5km of the underground cable located within public roads and 9.5km located off-road in private lands.

Status Update

- ✓ Letters of Consent received: Kildare CC, Meath CCs, ESB, UE & IR
- ✓ Mar ‘23: HV Forum meeting with Roads Authorities. Key discussion pts:
  - History of project evolution & extensive consultation
  - Traffic management, diversion management
  - UGC interface with future road upgrade projects
  - Construction staging & reinstatement
- ✓ Apr ‘23: Planning submission lodged with ABP
- ✓ Jul '23: Planning reg. change (hedgerows)
- ✓ Mar ‘24: EIA completed & submitted to ABP

Next steps

- ❑ May – Jun '24: EIA Public Consultation
- ❑ Jun – Nov '24: Complete Ground Investigation surveys
- ❑ Jan ‘25: Final GI survey reports available
- ❑ Q4 ‘24: Project handover to ESBN – subject to planning grant



Working Group 2 - Transitional Projects

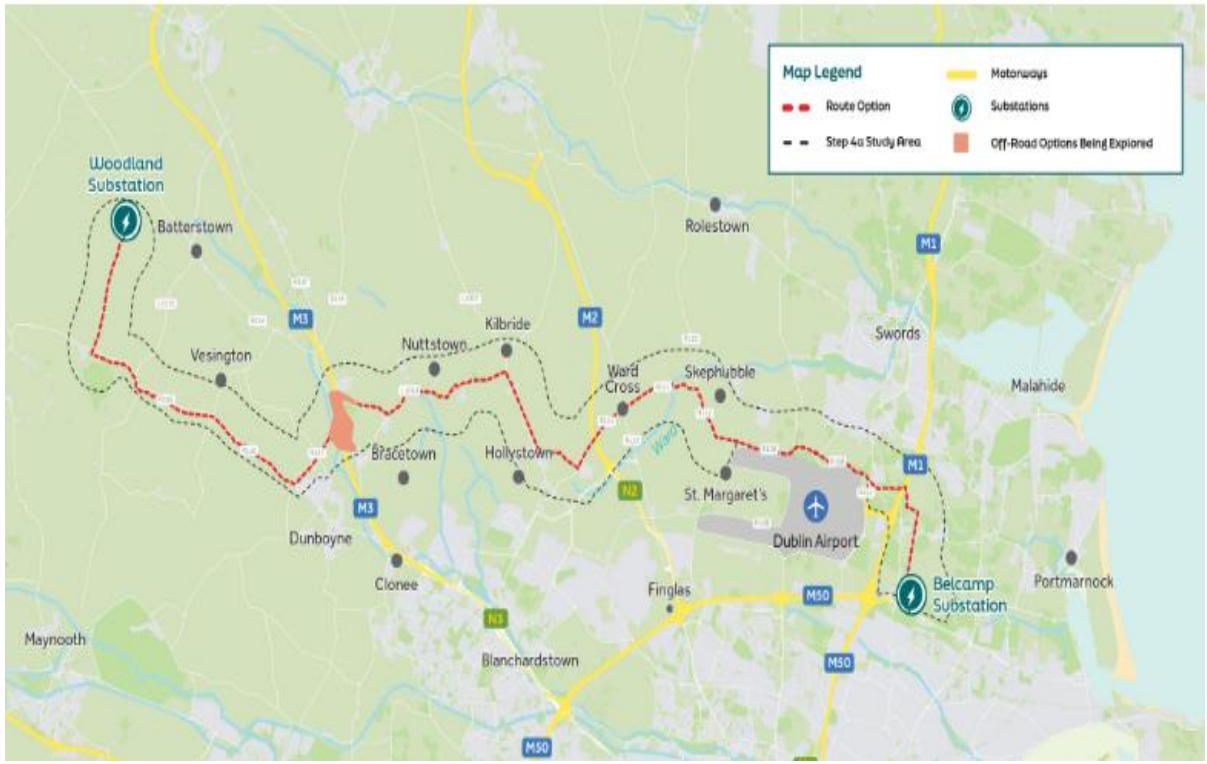
East Meath - North Dublin Project

WG2: East Meath North Dublin

Project Details:
A new 400 kV UGC electricity transmission connection between the Woodland Substation in Meath and the Belcamp Substation in north Dublin. The route is 37.5km with 26km of the underground cable located within public roads and 11.5km located off-road in private lands.

Status Update

- ✓ Letters of Consent received: Fingal & Meath CCs, DAA, IDA & ESB
- ✓ Feb '24: HV Forum meeting with Roads Authorities. Key discussion pts:
  - Decision on UGC vs OHL
  - Use of statutory powers
  - Traffic Management
  - Joint Bay compacting
- ✓ Mar '24: Planning submission lodged with ABP
- ✓ 5th Apr '24: ABP public consultation began for 7 weeks.



Next steps

- ❑ 23rd May: ABP public consultation closes
- ❑ Aug- Sep '24: Secure ground investigation road opening licensees
- ❑ Aug-Nov '24: Complete in-road ground investigation surveys
- ❑ Q3 '25: Handover project to ESBN for delivery – subject to planning grant

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Working Group 3- Engagement Framework

WG3: Pre-Planning Engagement Framework

- An Engagement Framework between electricity and road sectors has been prepared and is being reviewed and discussed.
- This document is to detail the who, what, when, where, why of consultation on projects.
- Provides for a series of meetings ('interactions') at each step of the project.
- Ultimate goals are better working, faster delivery, synergies, and 'no objections'.
- Key feedback so far:
    - More detail on EirGrid's route selection process.
    - More strategic/high-level consultation outside of projects.
    - Joint delivery/shared infrastructure to be pushed (e.g. greenways as infrastructure corridors).
- Strategic/ high-level consultation is to identify joint ways of working at an early stage. Sometimes consultation can occur too late in a programme to allow synergies. This will identify upcoming projects so early joint working can be planned in.

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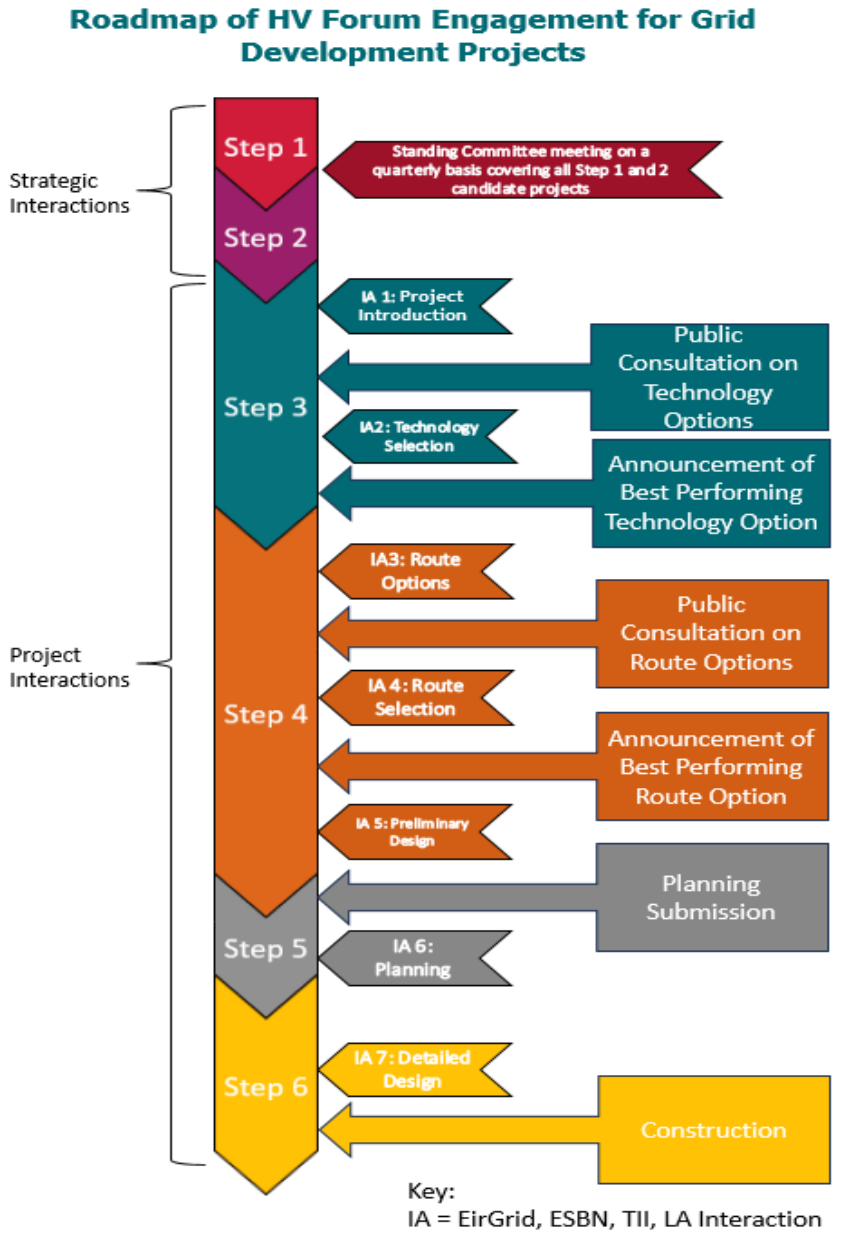
WG3: Pre-Planning Engagement Framework



- DRAFT roadmap and subject to change.

Steps:

- EirGrid's Project Delivery Framework.

Interactions:

- Meetings with EirGrid, ESBN, TII, and Local Authorities.

Public Consultation/Announcements:

- Milestones on the project.

Key takeaway: meetings before and after all milestones to allow for meaningful input.

Working Group 4 - Costs and Liabilities

WG4: Costs and Liabilities

Joint TII/RMO/ESBN/EirGrid team established

Terms of Reference developed and approved

Work ongoing to identify and agree position:

Cost of participation by roads authorities.
Direct Project Costs including reinstatement & ancillaries.
Future cost liabilities post construction.

Developing protocol for addressing costs and liabilities

Working Group 5 – Enduring Standards & Protocols

WG5: Enduring Standards & Protocols

Collaborative Working Group established across the Roads and Electricity sectors

Terms of Reference developed

Focus on:

- Development of enduring standards and protocols related to HV infrastructure within the road network.
- Establishment of a Standards Group.

EirGrid SONI

Thank you

EirGrid GROUP

SOEF Advisory Council Meeting #8

Member Presentation: Heat Sector

- *Thomas O'Sullivan*

EirGrid SONI

INDUSTRY: THE VIRTUAL INTERCONNECTOR

SHAPING OUR ELECTRICITY FUTURE ADVISORY COUNCIL

MAY 2024

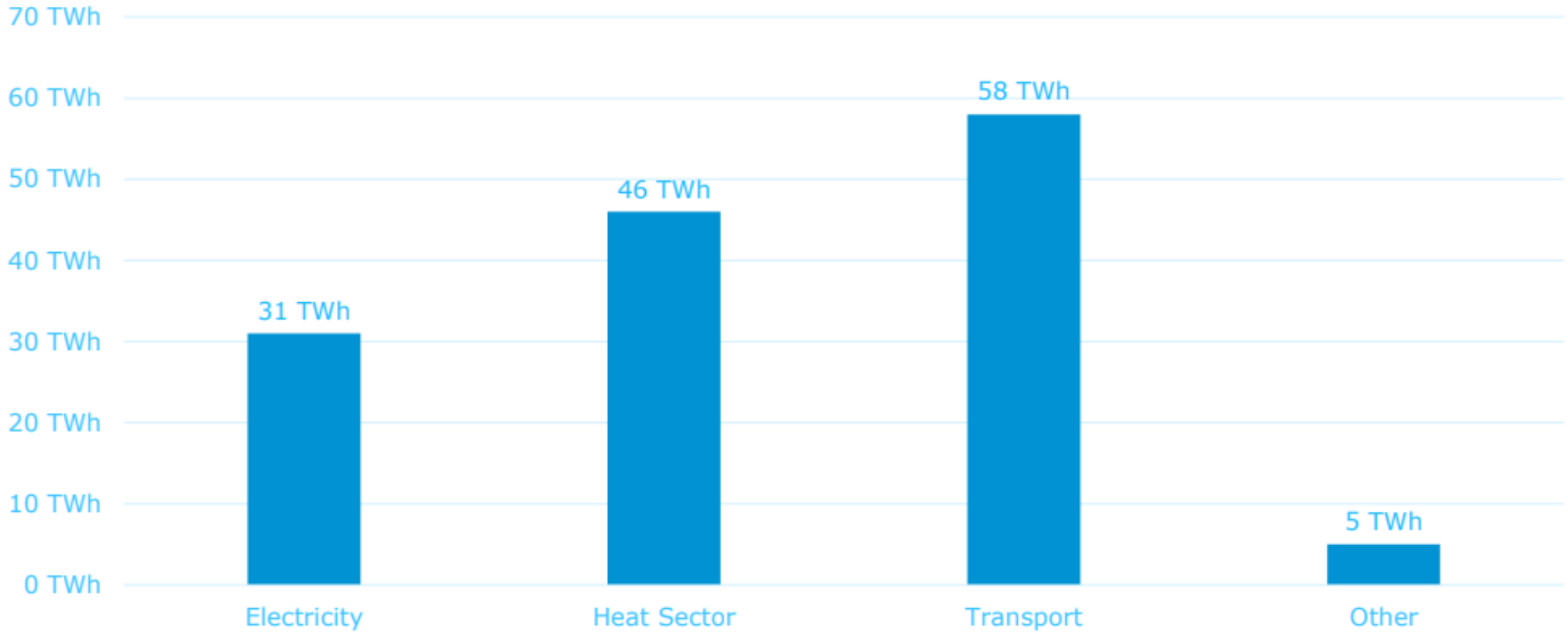
THOMAS O'SULLIVAN

Learning Objectives

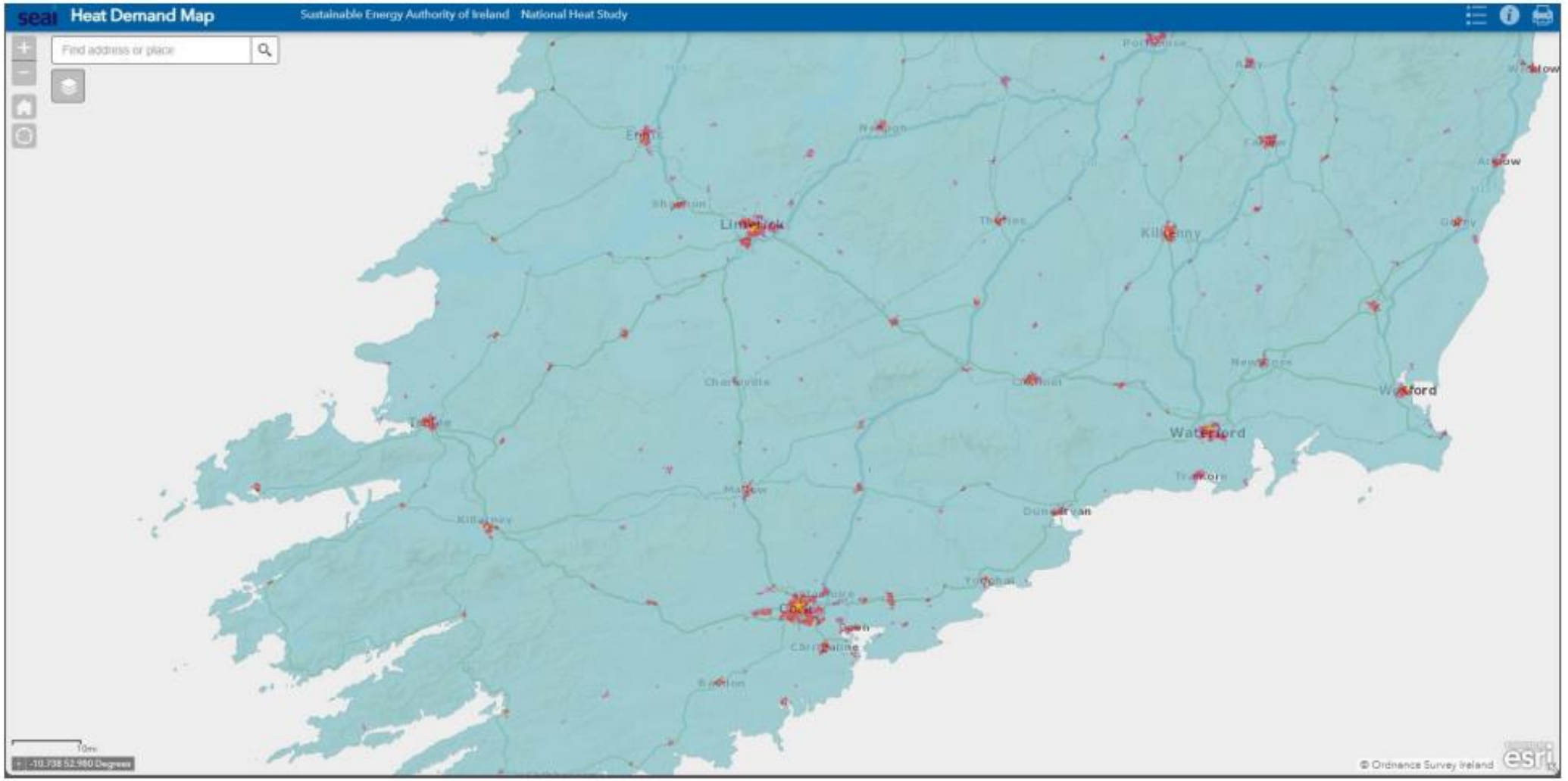
- Scale of the heat sector
- Technology to electrify high temperature heat
- Opportunity from the integration of 22GW of variable RESe
- Barriers
- Call to Action

Heat sector

Irelands Final Energy Consumption



Distribution of Industrial Heat Demand



Gas - the incumbent

- Wholesale gas price currently €27/MWh
  - Historic Stability ~€17/MWh (before the invasion of Ukraine)
  - Stability allowed investment

Policy

Replace fossil fuels with renewable energy

Integrate renewables across heat, power and transport…..

2019/943 Electricity Market Regulation

Annex 1

"…non-discriminatory market access, empower consumers, ensure competitiveness on the global market as well as demand response…"

70-75% carbon neutral heating by 2030

Electrification ..displacing the use of fossil fuels ..

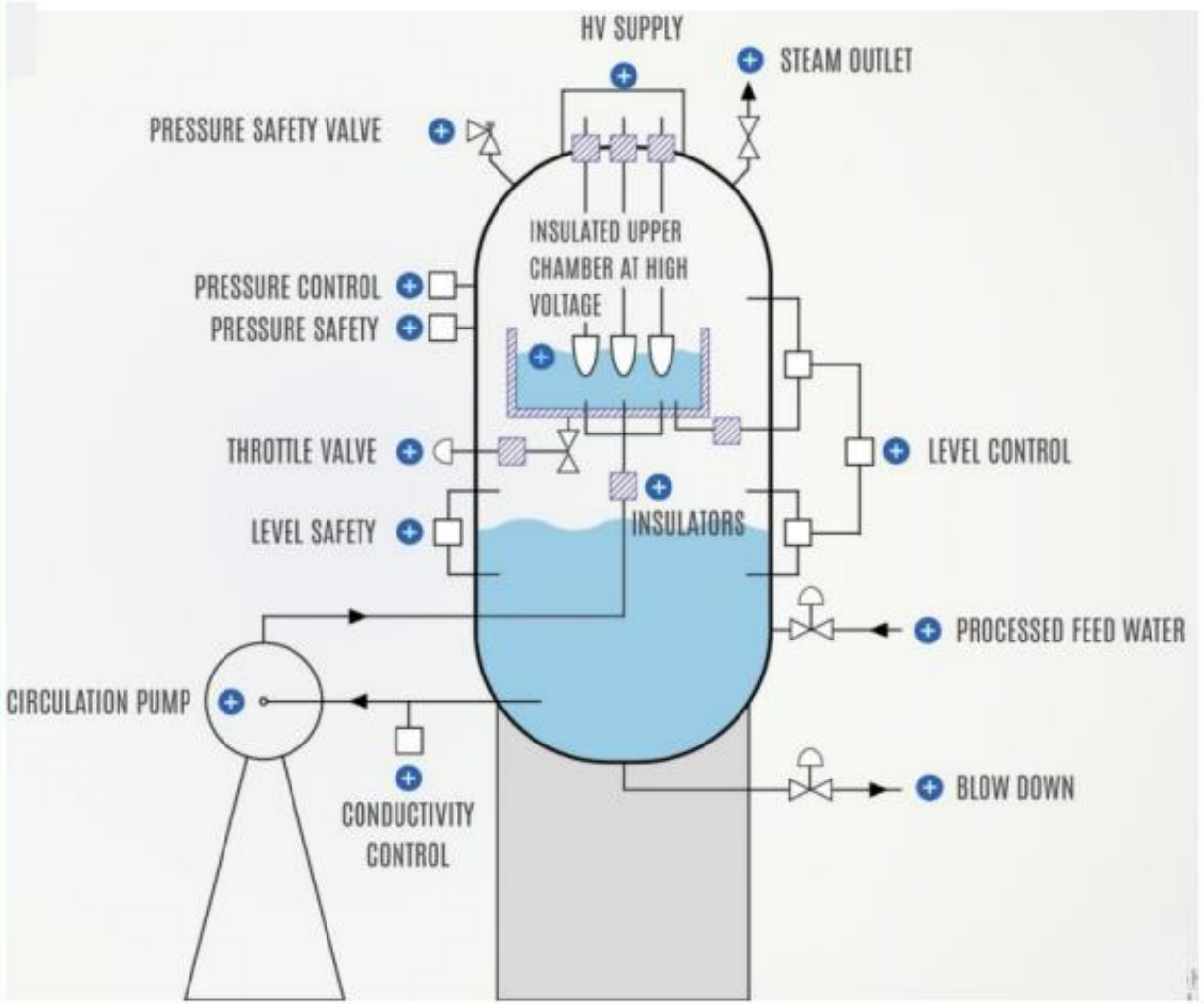
Flexible demand

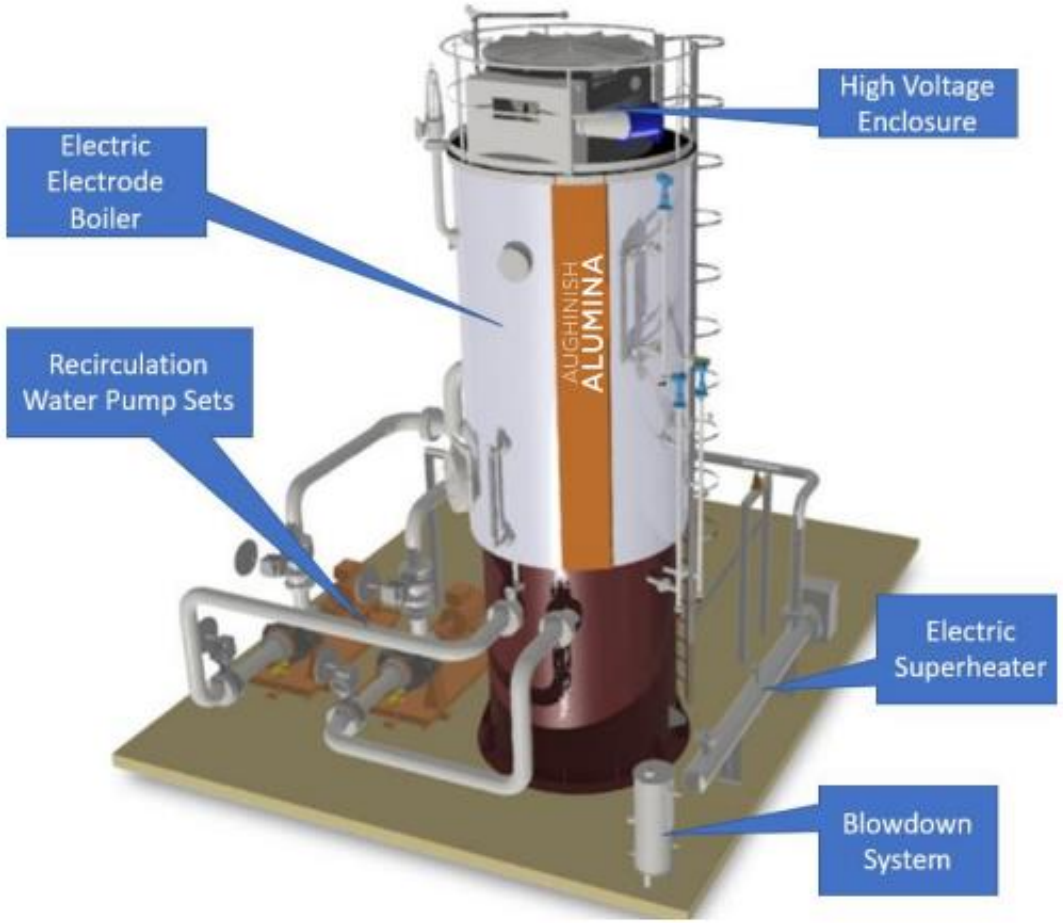
22GW RESe

Energy security of supply

Technology to electrify high temperature heat

ELECTRIC BOILER 25MW



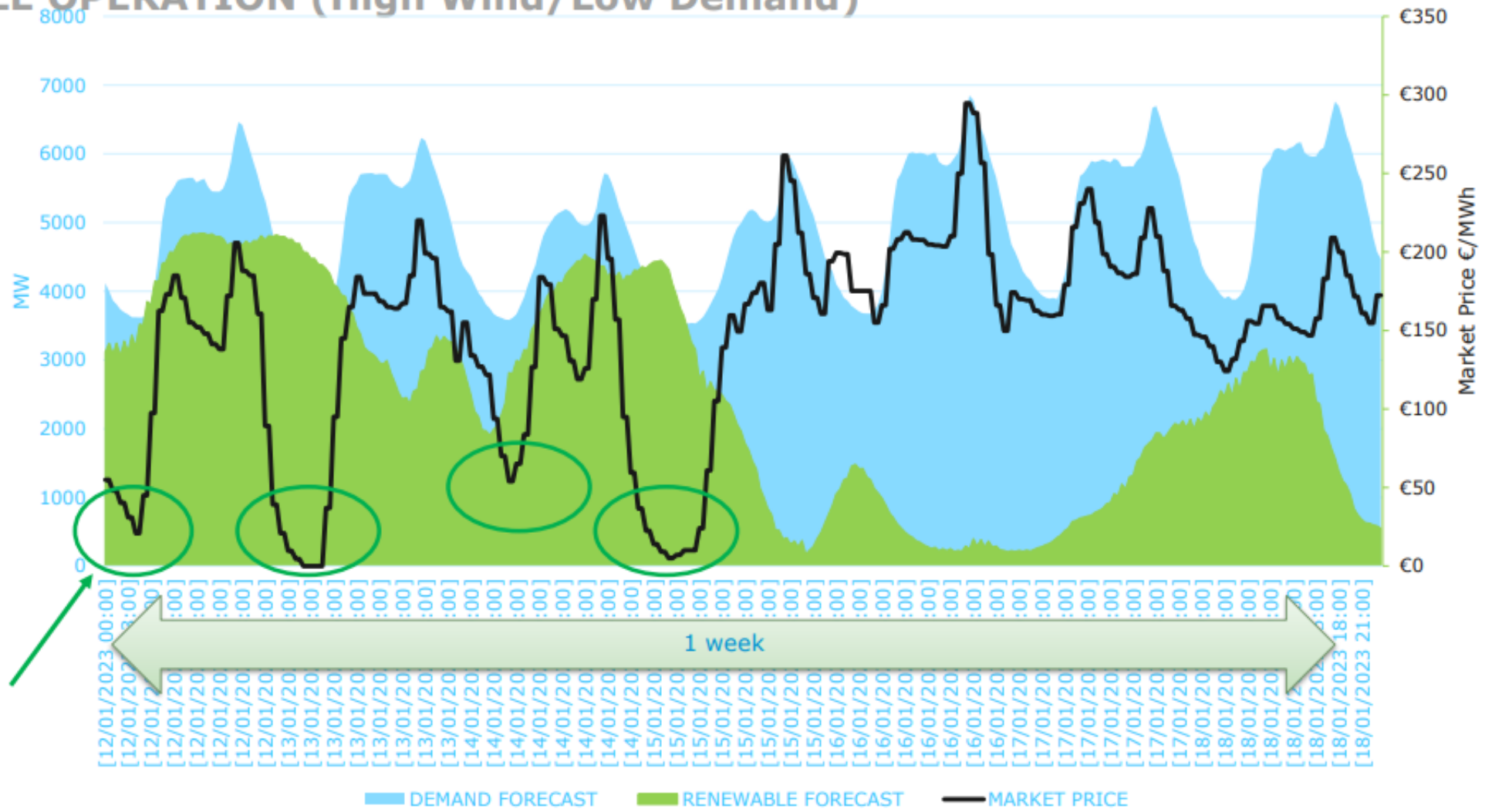


CONSTRUCTION

WHEN DOES IT OPERATE

FLEXIBLE OPERATION (High Wind/Low Demand)

- Operate at high wind & High SNSP
- Do not operate at peak demand



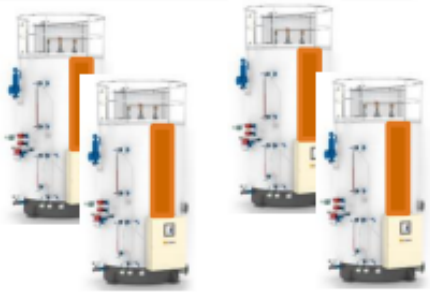
RENEWABLE FOLLOWING ELECTRIFICATION

- High temperature heat electrification in manufacturing
- Decarbonisation
- Utilise indigenous renewable power better
- Demand flexibility – retain existing gas boilers
- Use existing grid capacity
- Carbon neutral heat

2024

Subject to barrier removal

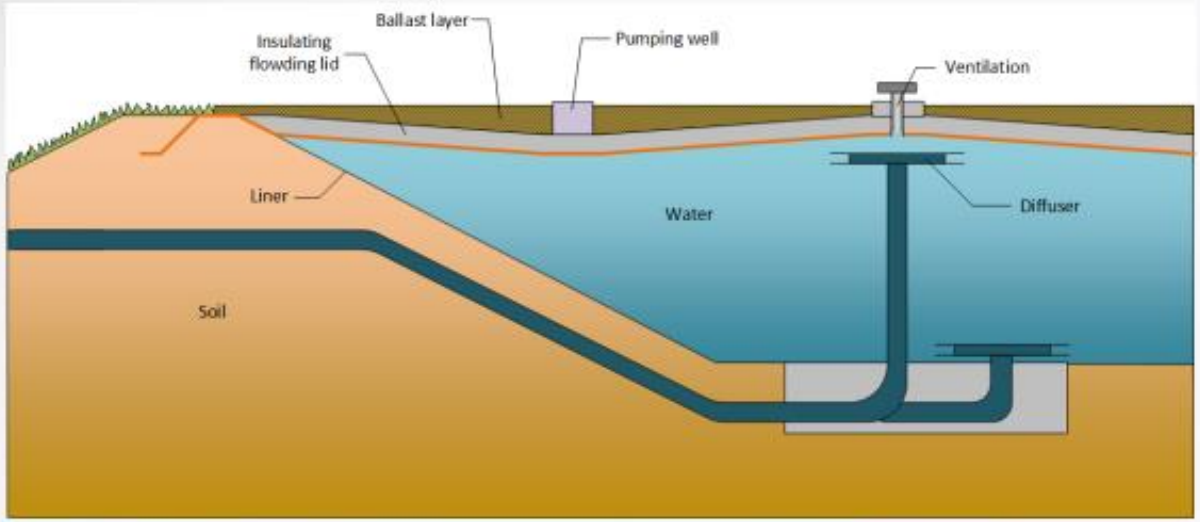
2030



Beyond 2030

Other technology including thermal storage and hydrogen

Low temperature thermal storage is cheap



Applications:

- District heating
- Lower temperature industry

Study finding:

Thermal storage Vs battery storage

- Multiple life span
- Small foot print
- Fractional cost

Thermal Storage is coming

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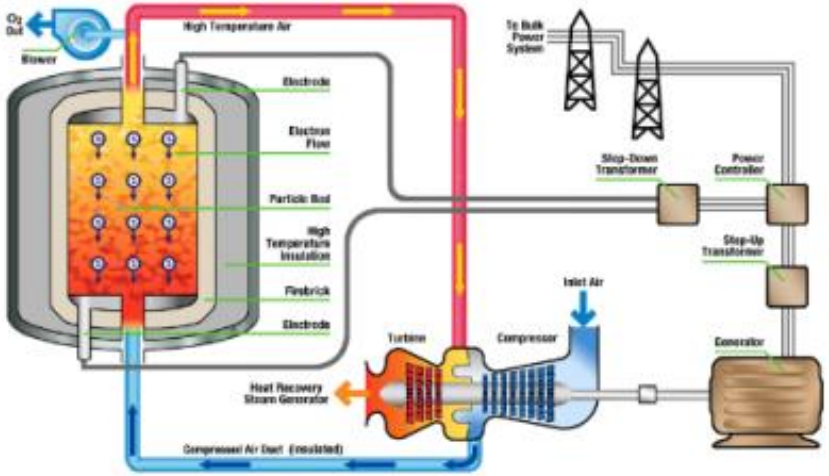
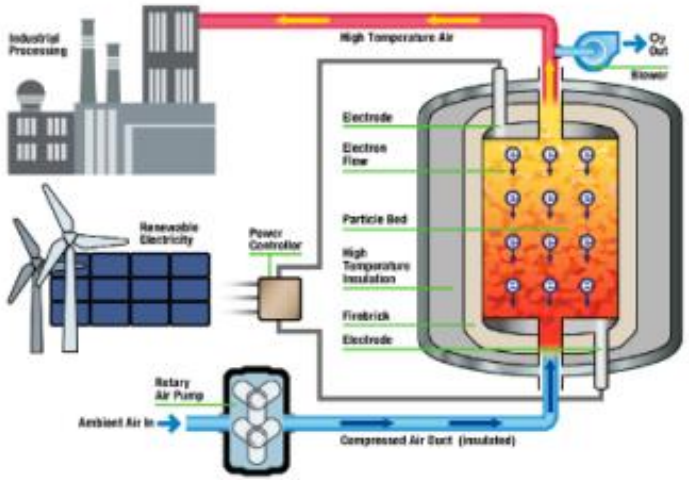
TECHNOLOGY

How it works

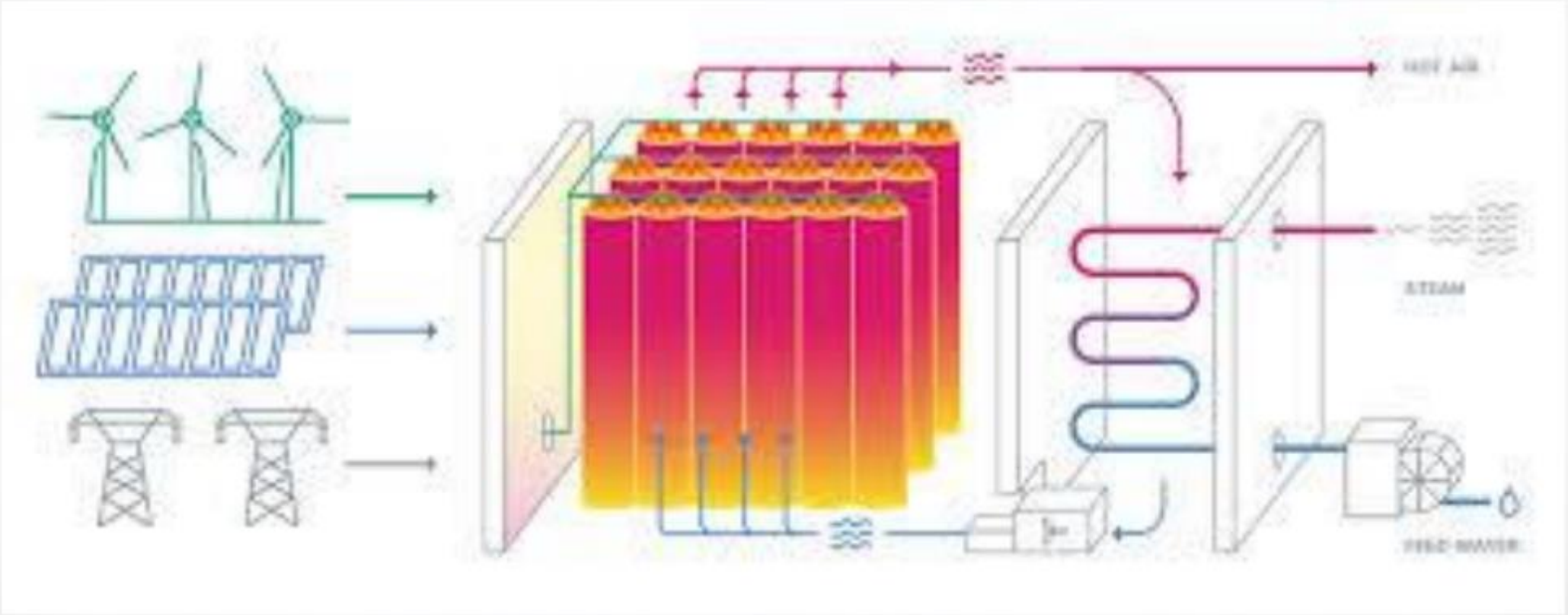
A technology that enables zero-carbon reversible combustion.



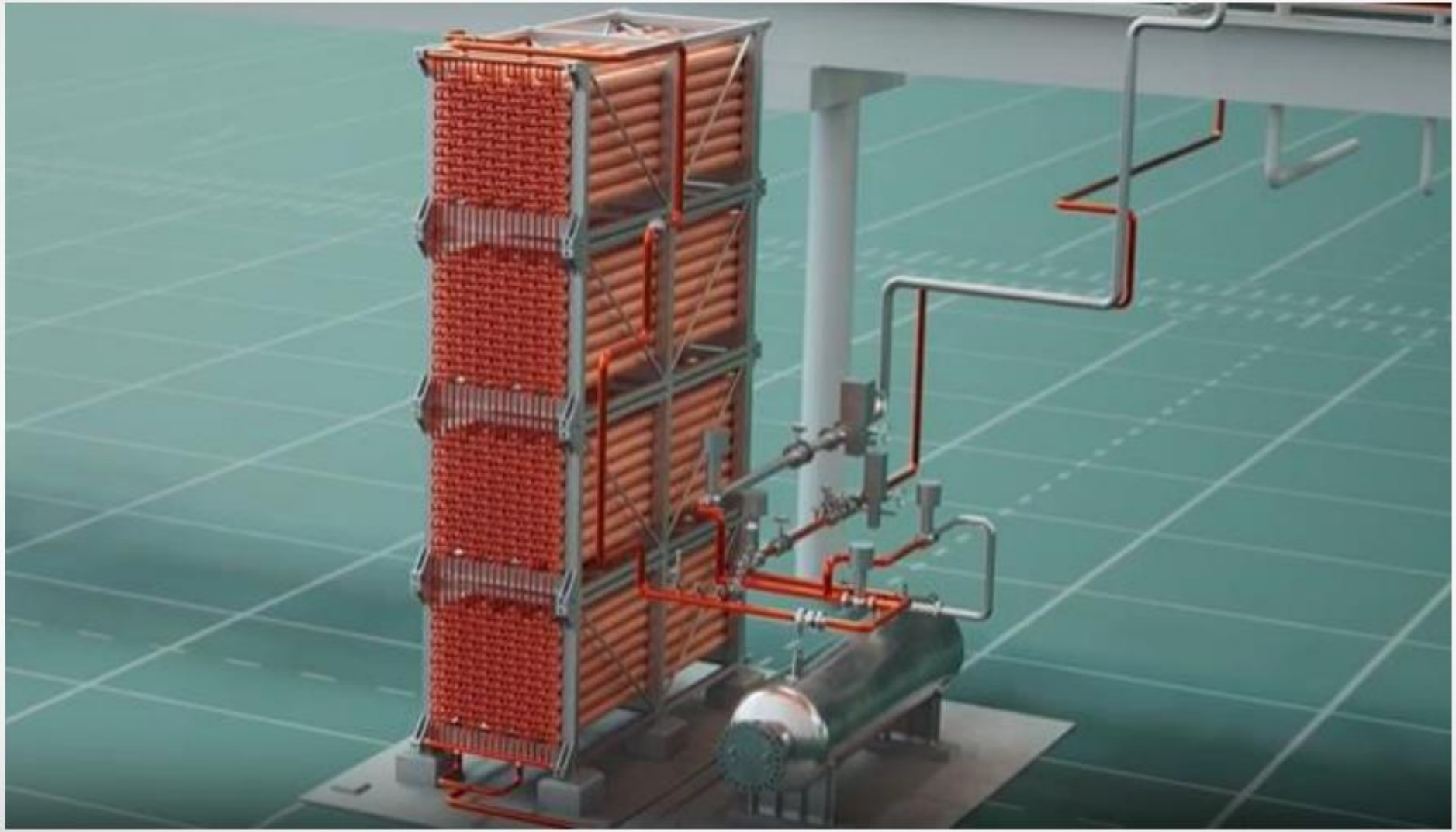


Learn more

Thermal Storage is coming

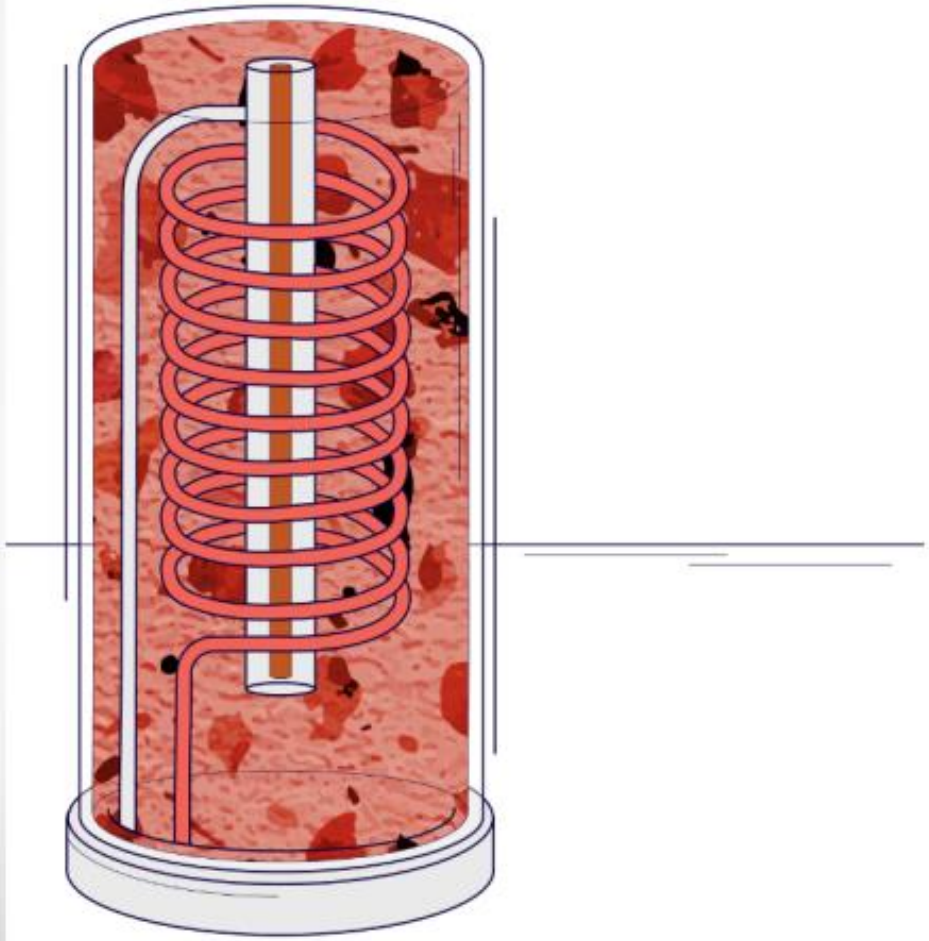


Thermal Storage is coming



Thermal Storage is coming

Caldera | Home | Product | Technology | Applications | More | Contact Us

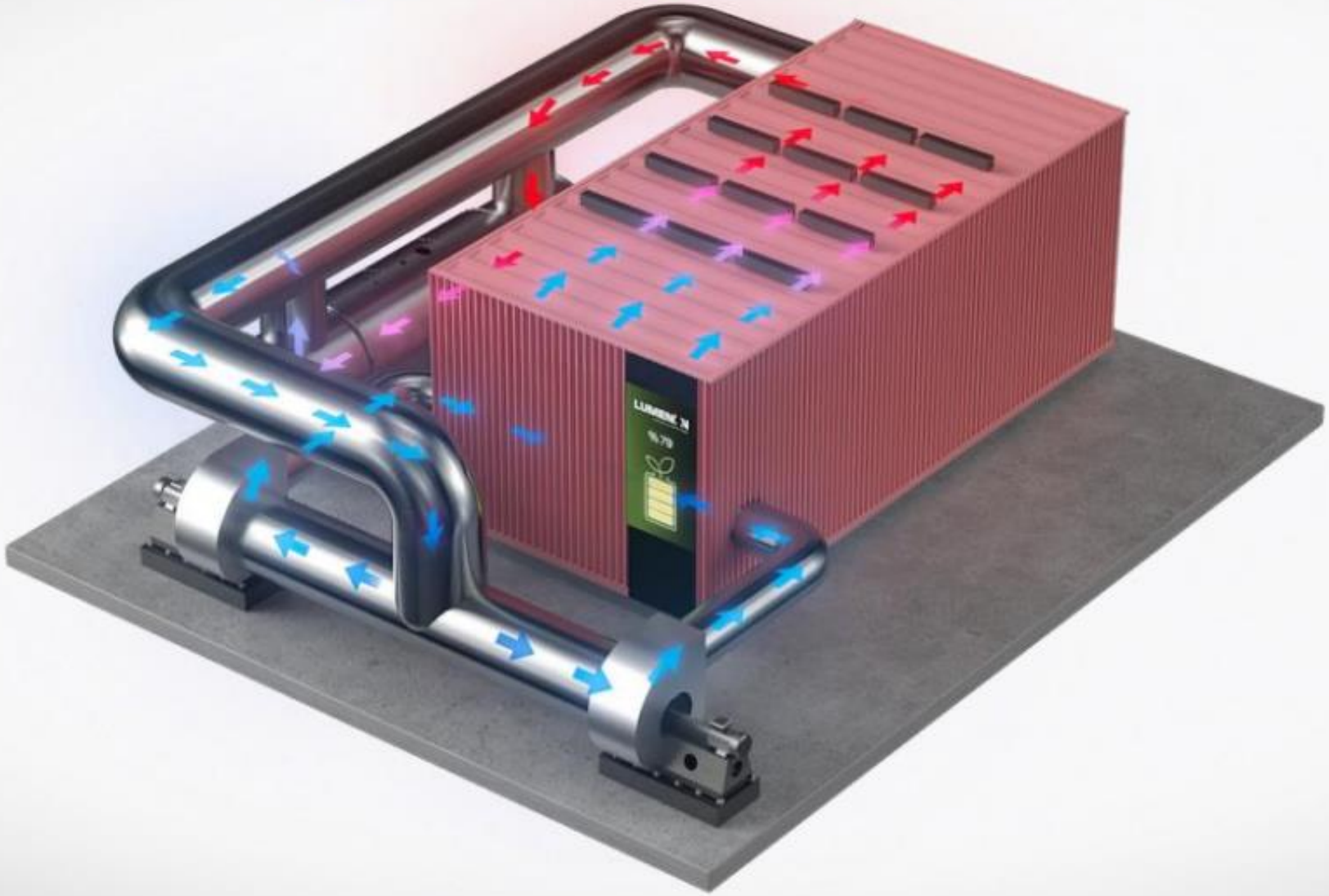


Solid Core

Each heat cell contains a solid core, made from Caldera's proprietary composite of recycled aluminium and volcanic rocks. This 'supermaterial' has a high energy density and is conductive, durable, and affordable. Recycled aluminium comes from sources such as used car engine blocks and incinerator waste, creating a demand for this low-grade metal. Molten aluminium is poured over volcanic rock to create a solid core, and this process can be reversed should product reach the end of its useful life.

Heat cell cores are heated from electricity using straight-forward electric elements. Thanks to the high conductivity the heat spreads throughout the block. Cores are considered 'full' when they reach 500°C. They are 'empty' when this temperature drops back down to around 200°C (depending on the application).

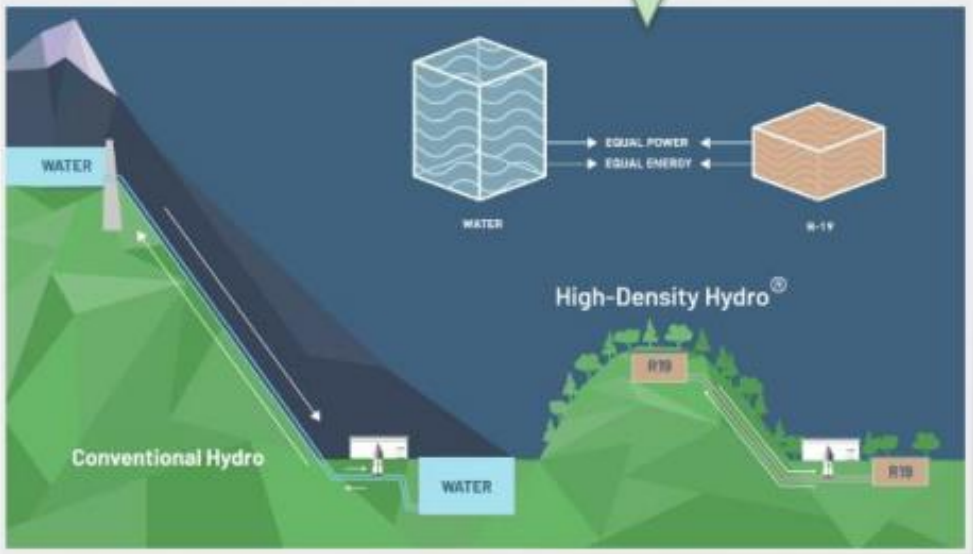
Thermal Storage is coming



Gravity Storage is evolving

Suspended Concrete,
25MW/200MWh

High-density Fluid



Postcard from the Future

Excess RESe (the opportunity)

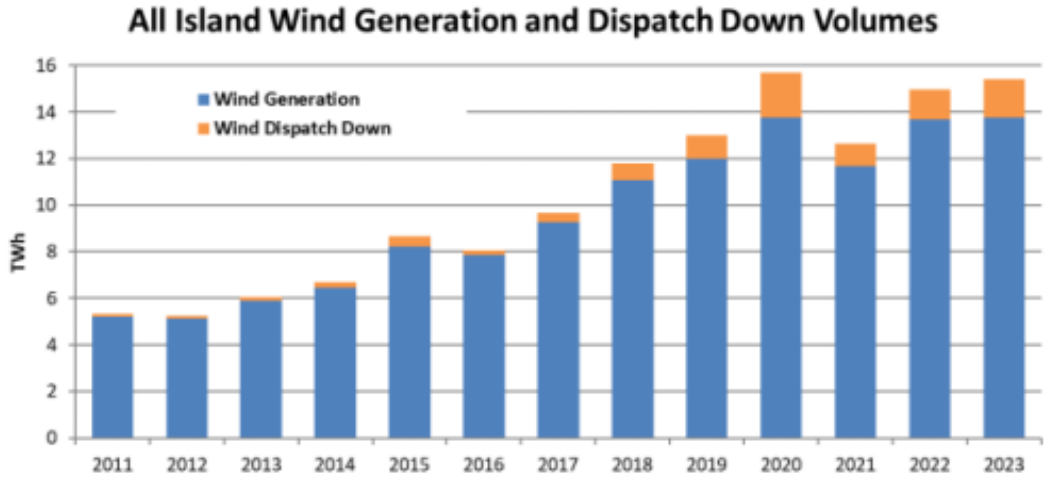
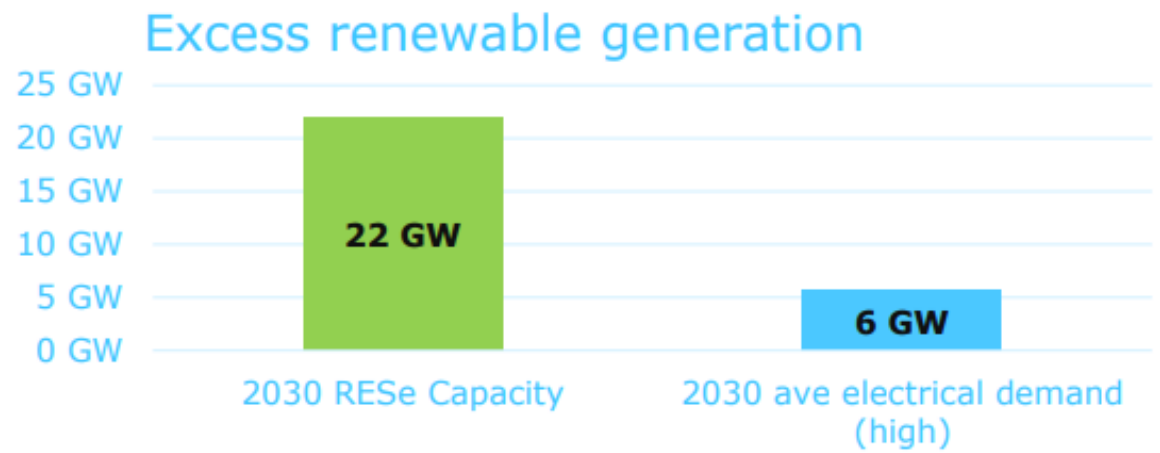


Figure 1: All Island Annual Wind Generation and Dispatch Down Volumes



Dispatch down of RESe:

- 12.1% recorded in 2020 (1.6TWh)
- 2030 35% wastage of RESe without mitigation

Eirgrid's Shaping our Electricity Future mitigation options:

- Change demand patterns
- New electrical interconnection (Clare to France)
- Batteries (€4.9billion)

Estimated xx to xxTWh "wastage" of RESe in 2030, about same of all industrial heat demand

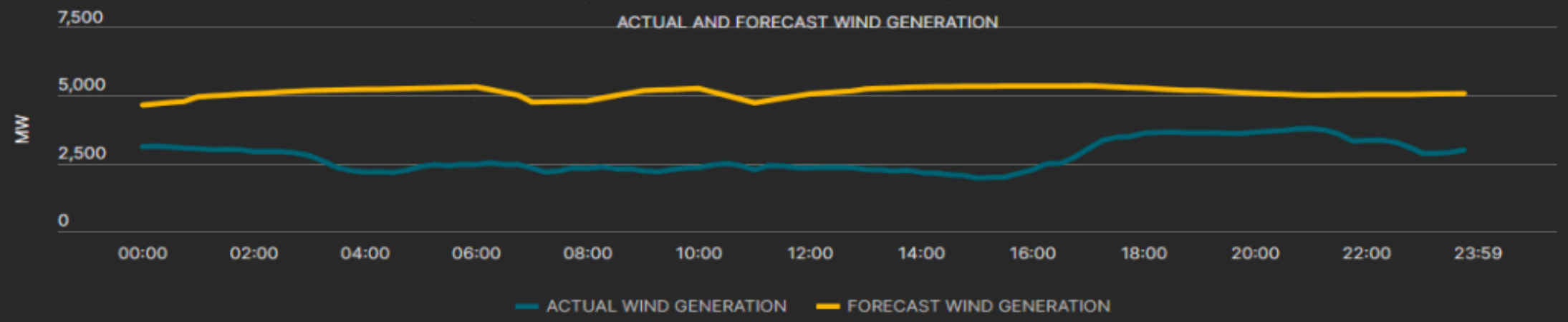
POSTCARD FROM THE FUTURE

Storm Kathleen Saturday 6th April

Actual and Forecast Wind Generation

Wind Generation is an estimate of the total electrical output of all wind farms on the system. Actual and Forecast Wind Generation are shown in 15 minute intervals.

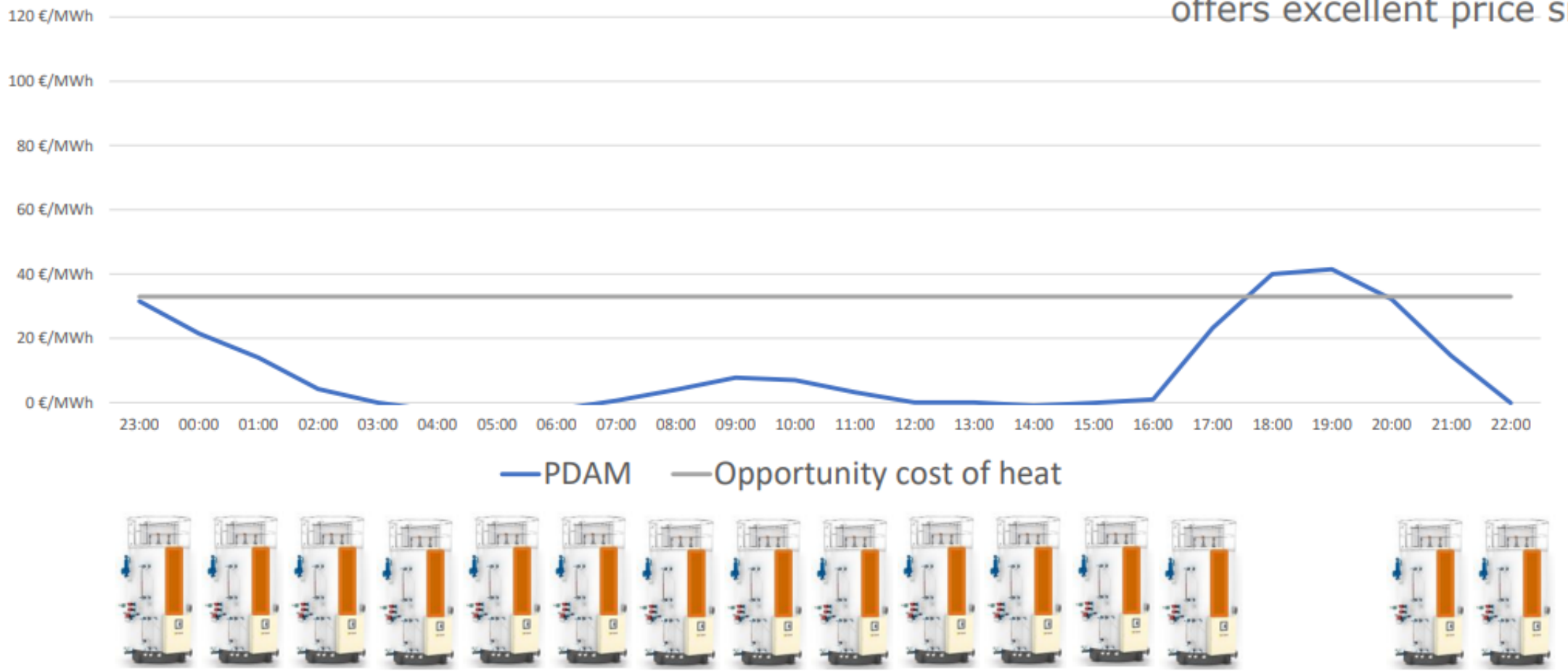
< > Latest **06/04/2024** **Day**



POSTCARD FROM THE FUTURE

Storm Kathleen Saturday 6th April

Wholesale electricity market offers excellent price signals

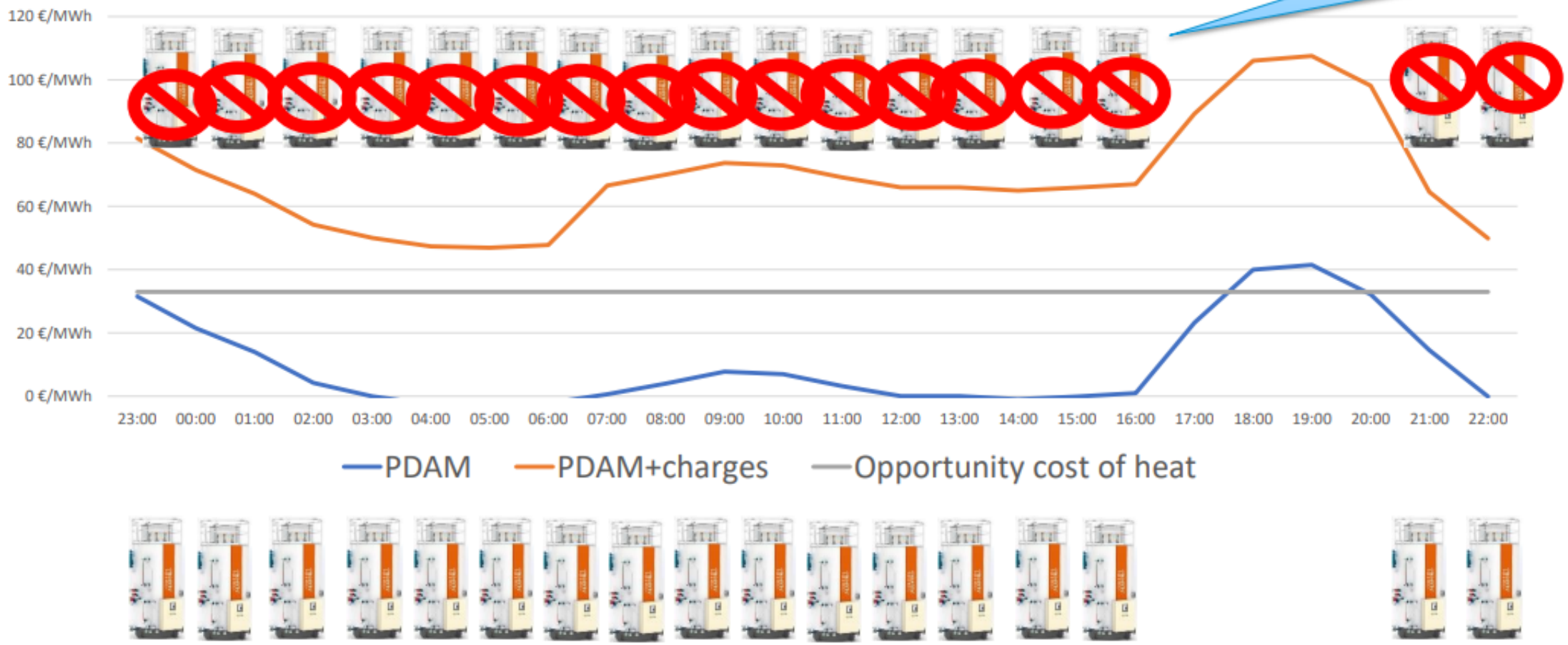


Significant barriers

POSTCARD FROM THE FUTURE

Storm Kathleen Saturday 6th April

Current electricity charging methodology actively promotes fossil fuel usage



SIGNIFICANT BARRIER

Flexible consumption is disincentivised by non-energy charging methodology

Below charges which lock in fossil fuel use

€/MWh		Justification
16	Imperfection Charge	Dispatchable Consumption is reducing Dispatch Balancing Costs
12	Capacity Charge	Dispatchable Consumption never requires firm Capacity
20	Grid	Dispatchable Consumption reduces the grid investment costs
15	PSO	Purpose to support RESe integration

SIGNIFICANT BARRIER

Potential Solutions - Vital for national 51% decarbonisation targets

1.Dynamic network charging methodology

- Unchanged grid income but flexible usage is incentivised
- Excess variable renewable generation needs new variable demand
- Benefit to all consumers & enhance Irelands competitiveness
- Very high charges in times of low SNSP

2. Demand Turn Up Service Payment (Green Soak)

- Simpler implementation
- UK demonstrated
- Heat user pays all charges upfront – get compensation
- Can be a competitive market

Call to action

CALL TO ACTION

Encourage renewable following

Make non-energy charges dynamic to support renewable following (or a Green Soak service procurement)

Scheduling and Dispatch

- Interim, register Dispatchable Consumption as a battery, give access to Scheduling and Dispatch reforms

Technology bias

- Model 1GW of volume unlimited Dispatchable Consumption, Model 2GW of 24hr thermal storage
  - Tell Policy Makers, tell Regulators
- Procure the desired outcome not a specific technology

Carbon reporting

- Marginal carbon intensity reporting methodology
- Allow sharing of carbon ceiling from heat and transport to the electricity sector

End

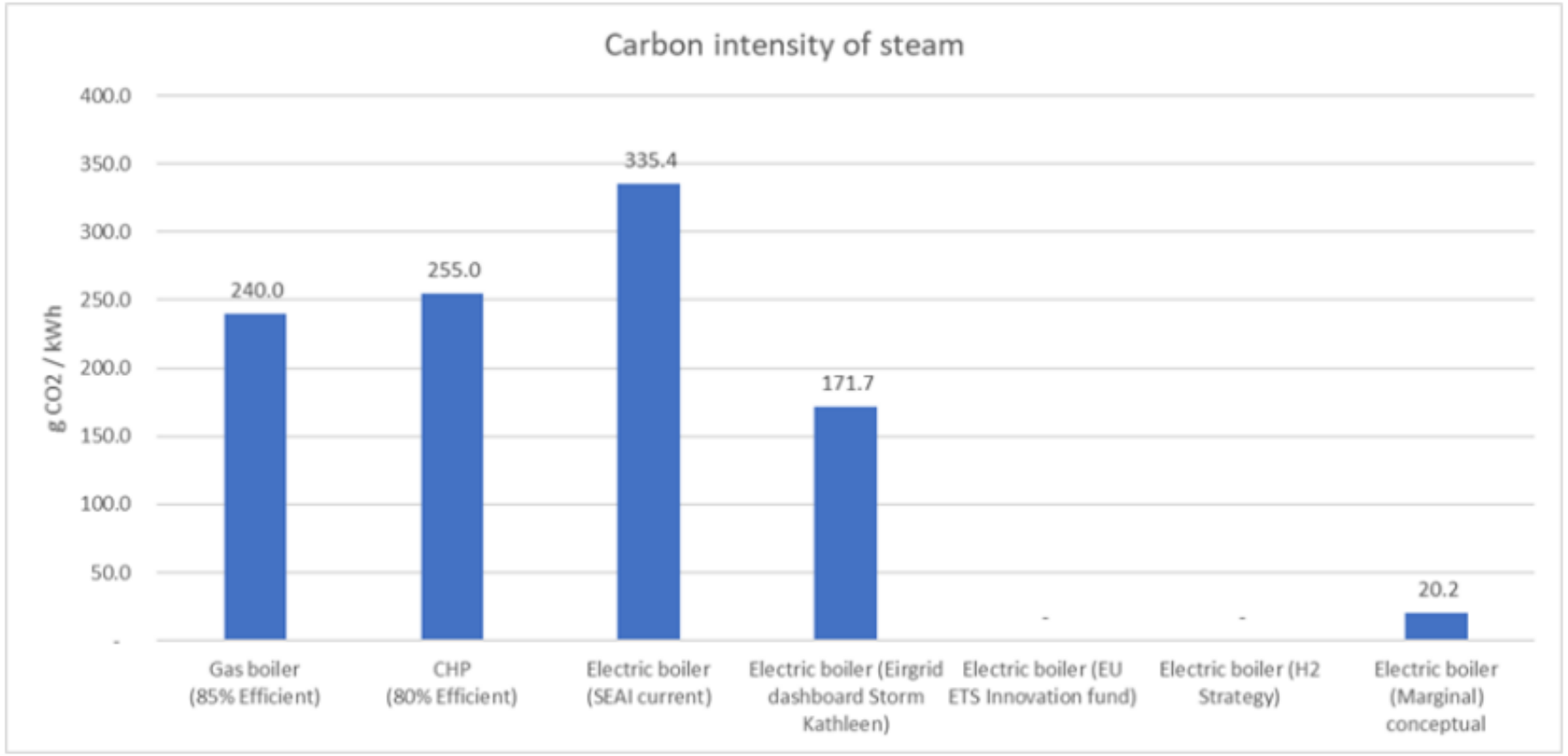
LEGACY NETWORK CHARGING METHODOLOGY

Appendix 1 – Additional "Fixed" Charges – Current Structure

Explanation of the current structure of fixed charges added to wholesale cost of electricity

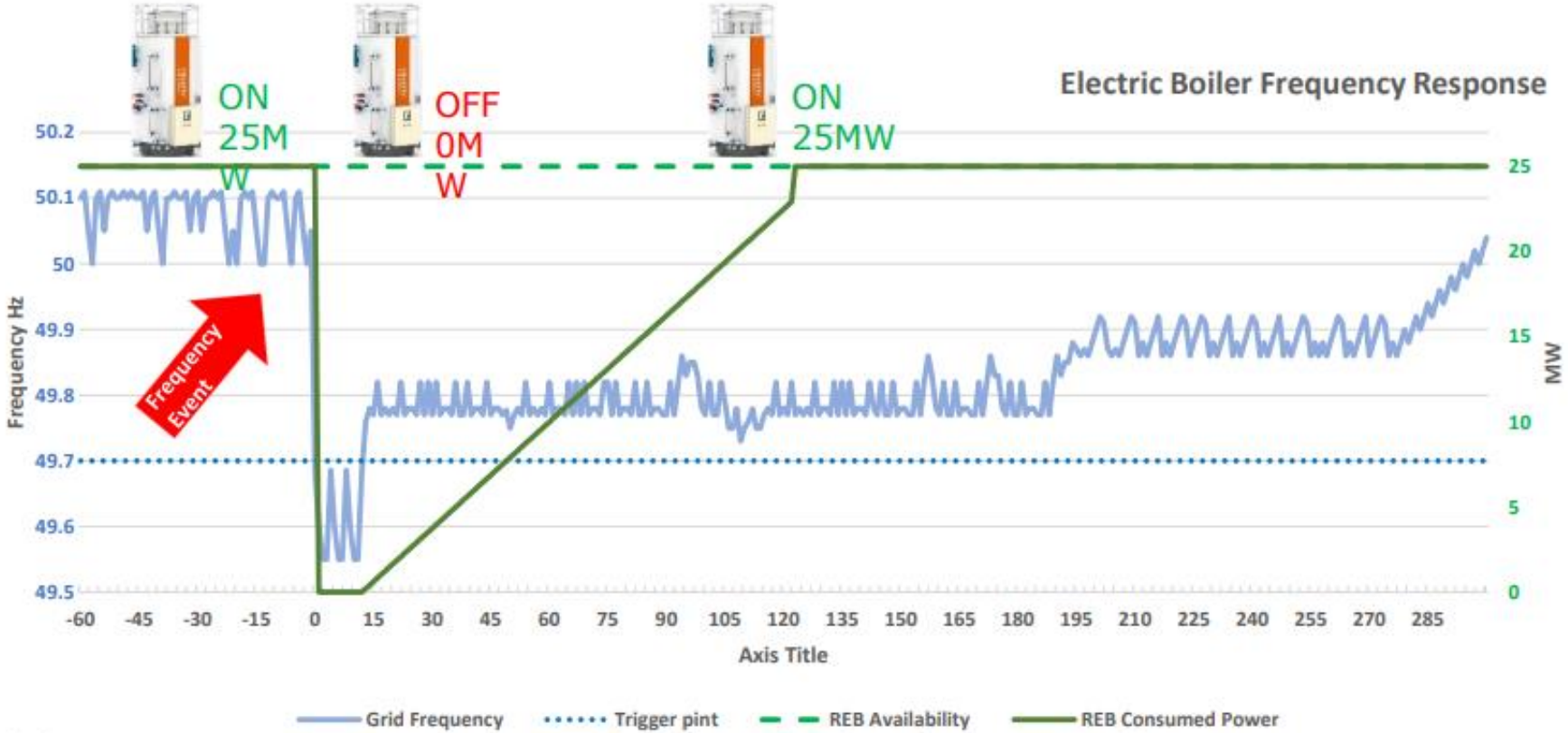
	Time Period		
	Night €/MWh	Day €/MWh	Peak €/MWh
Eirgrid Charges:			
Demand Network Transfer Charge	3.35	3.35	3.35
Demand System Services Charge - 2 rates			
Peak 5-7pm	0.00	0.00	20.58
Off Peak	18.71	18.71	0.00
SEMO Charges:			
Supplier Charge Price (only charged during daytime consumption)			
€16.17/MWh or €0/MWh between 10pm and 7am	0.00	16.17	16.17
Total Variable Charge	0.60	0.60	0.60
Imperfection Price	11.52	11.52	11.52
Total additional "fixed" charges on top of Electricity Price excl. PSO	**34.18**	**50.35**	**52.22**
PSO Levy:			
Based on any increase to site MIC will also be a significant charge			
We estimate additional >€2m/annum for a further three boilers			
This is about €14.45 on a MWh basis	14.45	14.45	14.45
Total additional "fixed" charges on top of Electricity Price incl. PSO	**48.63**	**64.80**	**66.67**

EMISSIONS INTENSITY REPORTING FRAMEWORK FOR LEU - OPTIONS



WHEN DOES IT OPERATE

GRID SYSTEM SERVICES



- Grid objective is to maintain generation equal to demand to keep frequency stable
- Automated for a frequency Set Point e.g. 49.7Hz to disengage the electric boiler during a grid event
- Immediate loss of steam load, gas boiler will ramp up to compensate
- After the frequency event the electric boiler will restart and return to the Set Point.

SOEF Advisory Council Meeting #8

Discussion Topic: Joint Outage Transformation Programme

- *Philip Kennedy*
- *Niall Kearns*

EirGrid SONI

Joint Outage Transformation Programme

Briefing session

SOEF ACM

21/05/2024

Version: 1.0

Introduction and expectations

Purpose	To provide a briefing on the transmission outage review and the development of the joint outage transformation programme and roadmap
Agenda	▪ The background context, scale and pace of change needed ▪ The Joint Outage Transformation Programme ▪ Engaging DECC, CRU, WEI, ISEA, customers and industry ▪ Next steps
Your contribution	Please hold questions and answers to the end
What comes next	At the end, we will share how you can be engaged further

Key messages

To operate at 80% renewable energy from electricity sources by 2030 and meet our renewable and electrification targets, we are implementing a step change in the approach to outage management, while protecting and enhancing system security, ensuring regulatory compliance and performance, and delivering continued excellent customer service.

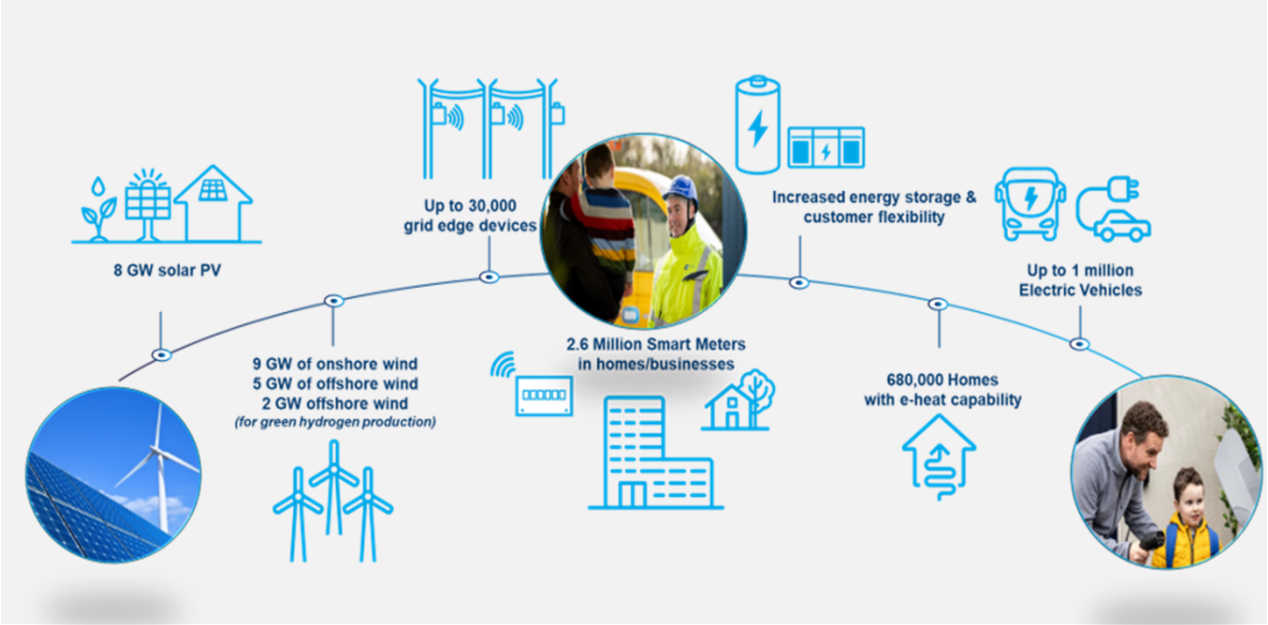
- Scale and pace of change needed is exceptional
- 18 interventions with potential for most step-change impact by 2030
- Stakeholder engagement, communications and action

Success of the Joint Outage Transformation Programme is critical to the delivery of the Climate Action Plan (CAP)

Outage management is a critical issue for the delivery of the Climate Action Plan (CAP)

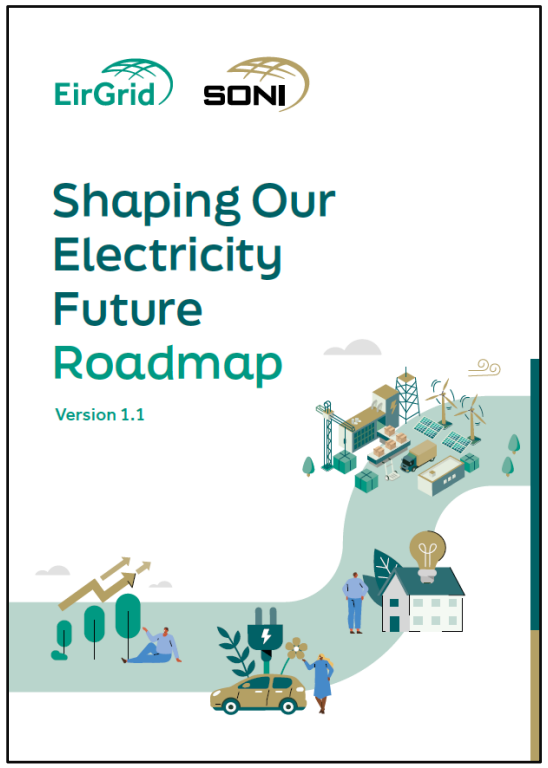
To meet electrification and renewable energy targets by 2030 significant change and investment is needed

The Joint Outage Transformation Oversight Board approved the roadmap on 20th December 2023



Outage management is a critical issue for the delivery of the Climate Action Plan (CAP)

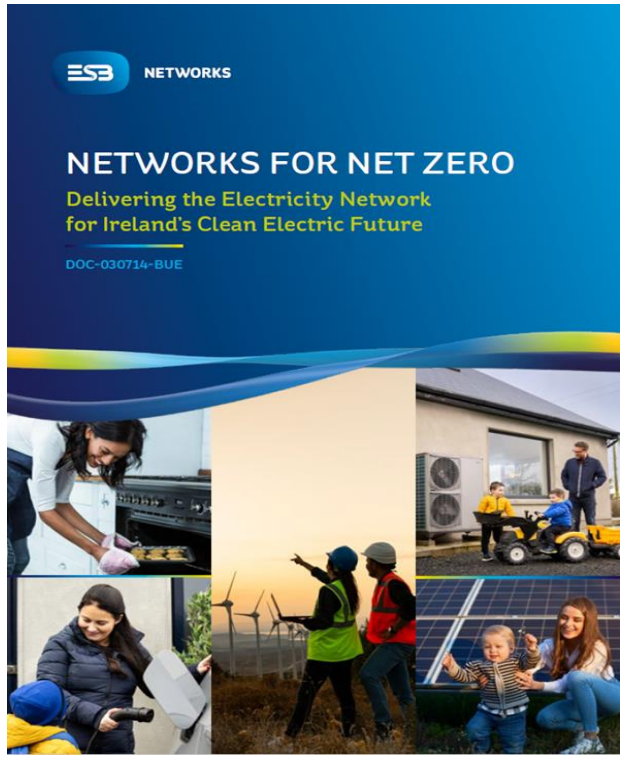
EirGrid's "**Shaping our Electricity Future**" (SOEF) and ESB Network's "**Networks for Net Zero**", set out roadmaps for transitioning to a low-carbon future



"Work with EirGrid to both maximise availability of transmission outages and utilise outage time efficiently to complete the required construction works."

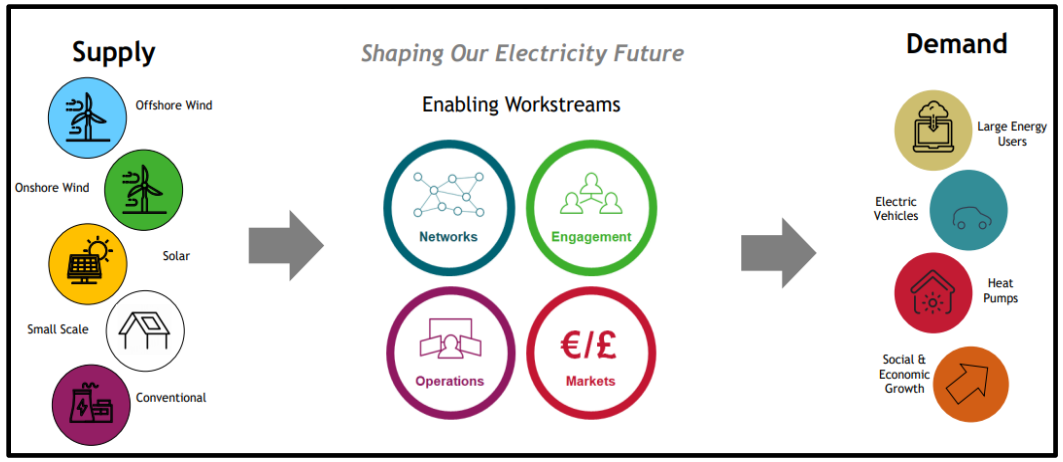
"The key areas where transformation is needed are the following:

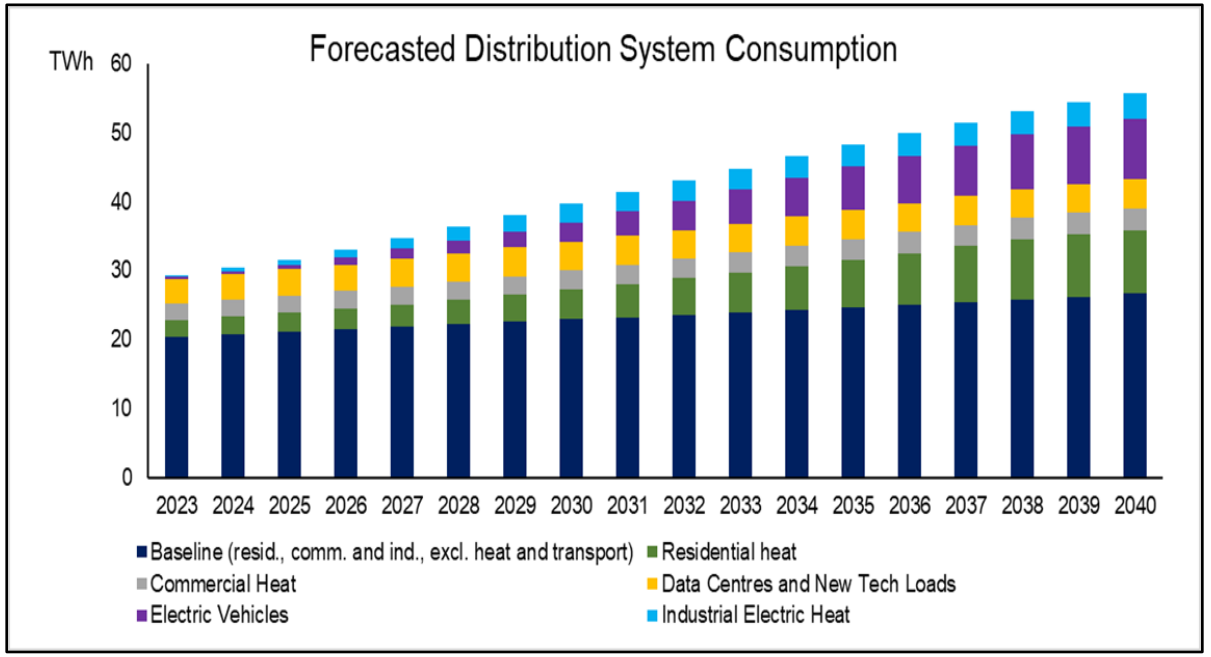
- **Increased outage utilisation and optimization**
- **Increased outage availability."**



To meet electrification and renewable energy targets by 2030 significant change and investment is needed

Given current work practices and approaches it is not possible to facilitate all the outages required out to 2030

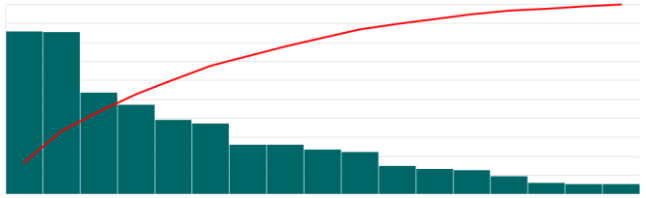




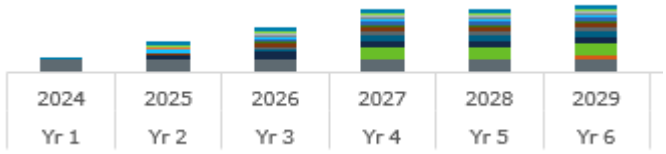
The Joint Outage Transformation Oversight Board approved the roadmap on 20th December 2023

A joint technical working group developed technically valid interventions, in multiple workshops, with multi-functional participation to assess scale of improvement, phasing of benefits, and impact of constraints

Scale of improvement



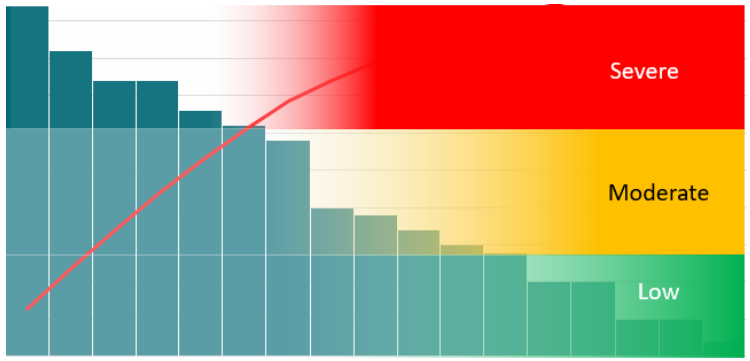
Phasing of benefits



Example constraints

- Resource capacity and capability
- Governance approvals, regulatory and financing
- IT systems capability and interoperability, supply chain capacity, and time

Constraints to deliverability and benefits realisation assessed for each intervention

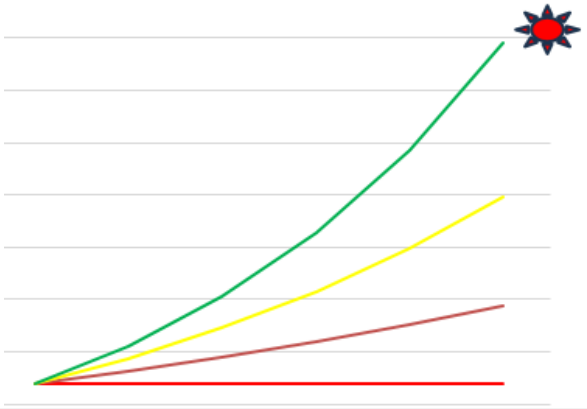


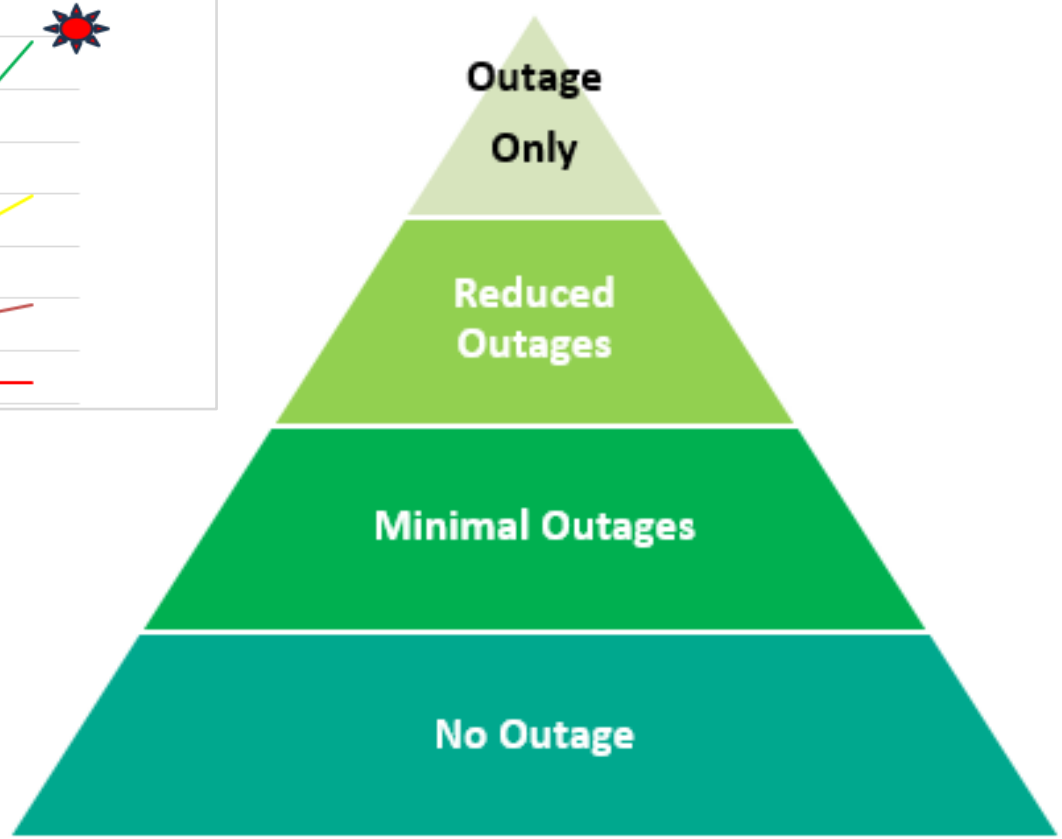
The scale and pace of change to deliver the required renewables and electrification is exceptional

A key risk to the grid development programme

3 x renewable power in 7 years

Increase project delivery 250%



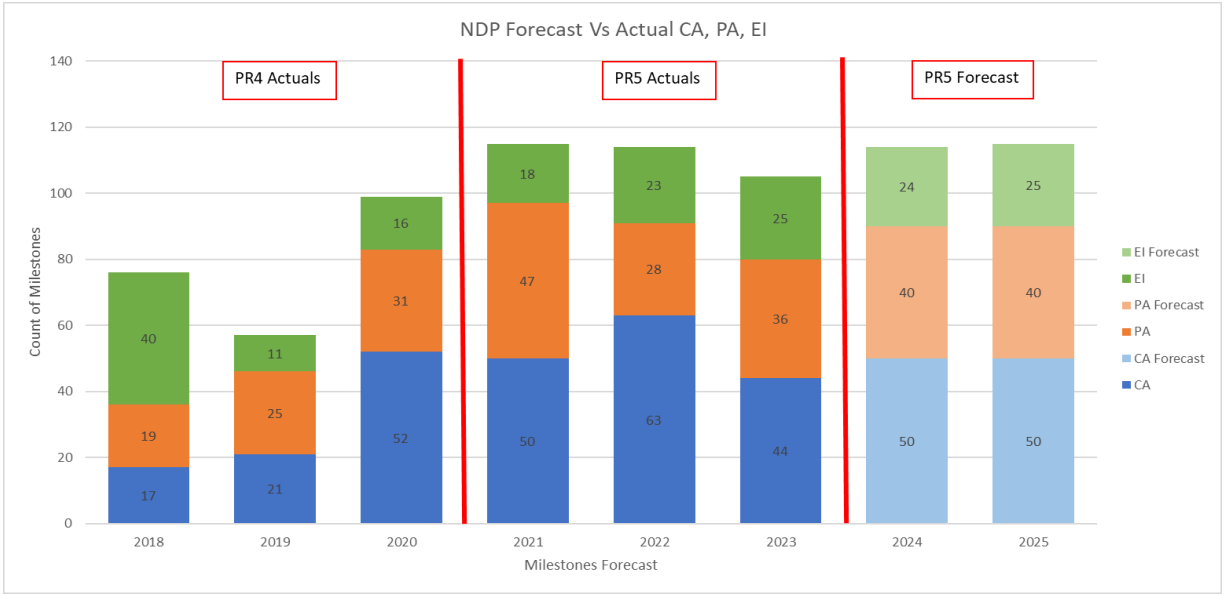


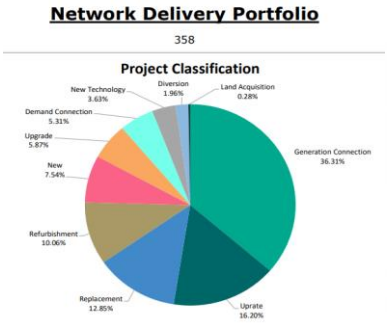
This change is a mammoth task, which is not without risk or challenge

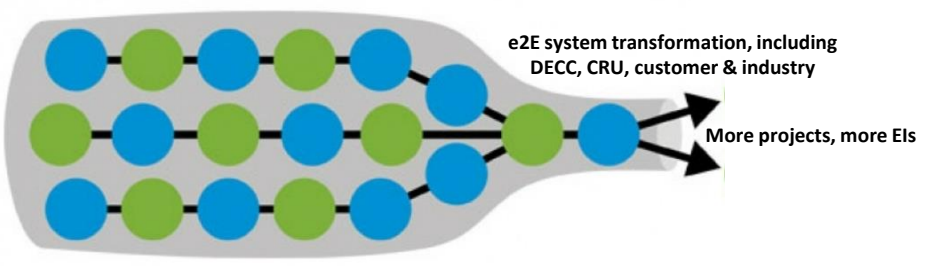
The Network Delivery Portfolio - the most ambitious programme of works ever undertaken on the transmission system

The pace of delivery through the development phase (Capital Approval & Project Agreement) has accelerated

Outages have been identified as a key risk to the grid delivery programme out to 2030







Key roadmap recommendations

Workstreams		Recommendations	
Management & change	Programme Management	Transformation is a single topic, activities must be aligned, and holistic solutions created	Customer and industry
	Strategy & Change	Alignment is required across EirGrid & ESB Networks as collaboration will be the force multiplier of outage transformation	
Project delivery		Enhancing work practices and extending working hours across the project life-cycle offer significant opportunities to maximize the outage window	Engage with all parties in the system and industry to ensure they are aware of, and comply with their responsibility in delivering this programme of work
System		To adopt a risk-based approach to the power system, conduct a review of operating security standards and maximise availability in the outage window	
Programme		To adopt an outage programme plan which is integrated, sequenced and prioritized to make the most efficient use of an outage window	
Regulatory		A joint intervention is needed to align ESB Networks and EirGrid incentives to enhance alignment and collaboration	
Policy		To adopt a risk-based asset management approach with new policy standards to be adopted	
Information and technology		Benefits of ecosystem-wide digital transformation opportunities must be realized and maximized for basing decisions on a timely single version of the truth (golden thread)	

The JOTP's 18 interventions[(i)] have the best potential for the scale of step-change impact needed by 2030 and are spread across 7 workstreams

Joint Workstreams

Joint Function/BAU Delivery

Project Delivery

- Progress and continue to develop work methods for working near/on energised apparatus
- Develop work methods for live working
- Across the end-to-end system, including EirGrid and ESB Networks, extend working hours that are prevented by constraints
- Progress and develop end-to-end work methods to minimise outage (conduct offline builds in free spaces)

System

- Take more risk on the power system to maximise outage availability
- Review Operational Security Standards (OSS) move to a probabilistic/statistical approach
- Review Operational Security Standards (OSS) (to undertake more splits and tails/radialising)
- Extend the outage window

Programme

- Technical focus on the minimisation of outage from GW 1
- Consolidate nodal projects and programme manage
- Implement a totally integrated and agreed programme out to 2030
- Generate project benefits in a sequenced and prioritised (as required) constrained NDP

Regulatory

- Align EirGrid and ESB Networks incentives (mandated by CRU, incentivising overall delivery to achieve RES-e and electrification)
- Enable ESB Networks to capitalise joint outage planning from GW3 onward

Policy

- Move from a time-based to a risk-based asset management approach
- Introduce new policy standard ratings for 'brownfield' substations to reduce outages and unnecessary work

I & T

- Secure more digital integrations/solutions across the end-to-end system

Customer and Industry

Engage with all parties in the system and industry to ensure they are aware of, and comply with, their responsibilities in delivering this programme of work.

Note:
(i) Interventions will enable challenging outage requirements more, keeping more outages in, getting more outages in and forcing more projects into lost/wasted outages

The JOTP workstreams are up and running

Workstreams		Benefits	
Management & change	Programme Management	Set-up for successful implementation of the joint EirGrid and ESBN transformation of outage performance	Customer and industry
	Strategy & Change	Endorsement of an independently facilitated, evidenced-based, technically and economically robust set of recommendation	
Project delivery		Outage window is increased and therefore projects can be delivered	Reduce delays from major customers failing to meet key connection milestones and the adverse impact on other customers and potentially, an entire work programme
System		Increases outage window with an efficient and compliant system in place	
Programme		Efficient use of outage window for both EirGrid and ESBN	
Regulatory		Alignment of incentives will provide greater clarity and collaboration	
Policy		More efficient and effective approach to required maintenance pipeline reducing outage demand	
Information and technology		Right information available, at the right time and the right quality to inform better decision making (real-time, predictive, pre-emptive)	

Initiatives are underway or being considered, improvements are transitioning into BAU to deliver exponential benefit across the NDP/integrated programme

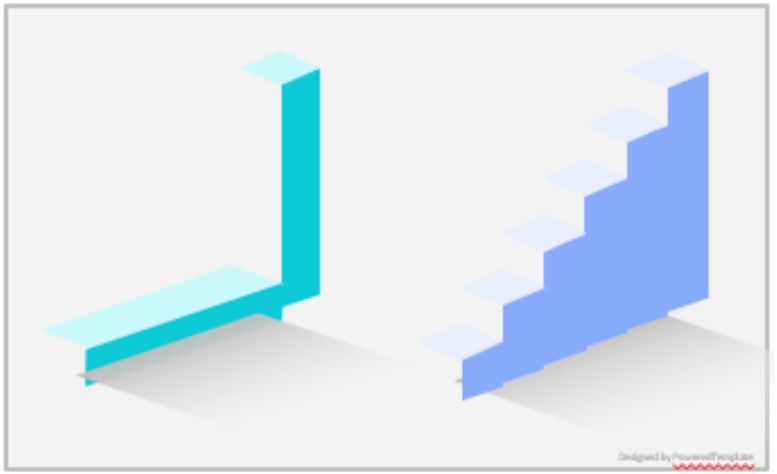
The 18 interventions must be applied systematically, and in combination with other initiatives

Step change improvement delivered by learning from and rolling out pilot initiatives, with some delivering

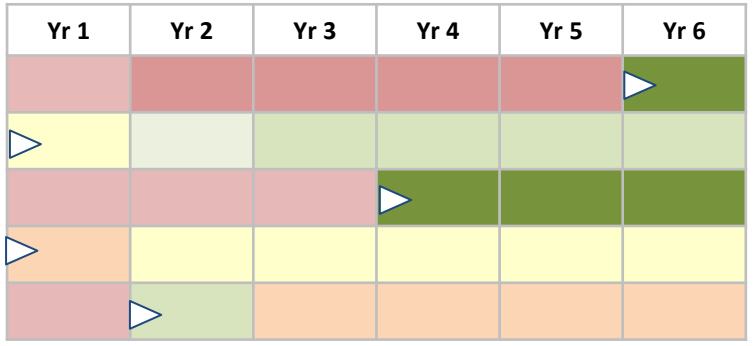
Initiatives are underway, or proof of concepts being considered, with many other BAU improvements continuing

2024 examples

- Lines outage analysis –TLAP implementation to tailor outages
- Off-season availability
- NDP and integrated programme
- Earlier TOP planning and customer readiness



Some take several years, others have a shorter-term focus



The Joint Outage Transformation Programme

Organisation and governance

Governance cadence

Monthly — Joint Outage Transformation Programme Oversight Board (JOTPOB)

Weekly — Joint Outage Transformation Programme Steering Group (JOTPSG)

Monthly — Joint Outage Transformation Programme Workstreams

MANAGEMENT & CHANGE

Joint delivery workstreams

- PROJECT DELIVERY
- SYSTEM
- PROGRAMME

Joint function / BAU delivery

- REGULATORY
- POLICY
- INFORMATION & TECHNOLOGY
- CUSTOMER & INDUSTRY

Collaboration by all stakeholders across the end-to-end system is needed to deliver this scale of change

Including the industry and customers

All parties in the system and industry will be engaged to ensure they are aware of, and comply with, their responsibilities in delivering this programme of work

Shaping Our Electricity Future

EirGrid GROUP

ESB NETWORKS

NETWORKS FOR NET ZERO
Delivering the Electricity Network for Ireland's Clean Electric Future

An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

CRU
An Coimisiún um Rialáil Fóntais
Commission for Regulation of Utilities

ISEA
Irish Solar Energy Association

Act Now
Accelerating onshore renewable energy in Ireland

WIND ENERGY IRELAND

Customer and Industry Working Group Members

Geraldine Dunphy, Project Leader, Renewables & Connections (ESBN)

Conor Farrell, Joint Workstream Lead (EirGrid)

James Finn, Commissioning Manager (ESBN)

Daniele Giustini, Team Lead Engineering & Asset Management (EirGrid)

Mark Glancy, Joint Workstream Lead (ESBN)

Mark Madigan, Strategic Stakeholder Manager (ESBN)

Brian Malone, Team Lead Customers & Connections (EirGrid)

Philip McDonald, Asset Transfer Lead (EirGrid)

Customer and Industry Working Group

Next steps, how you can help and be involved

1. Raise Customer Awareness

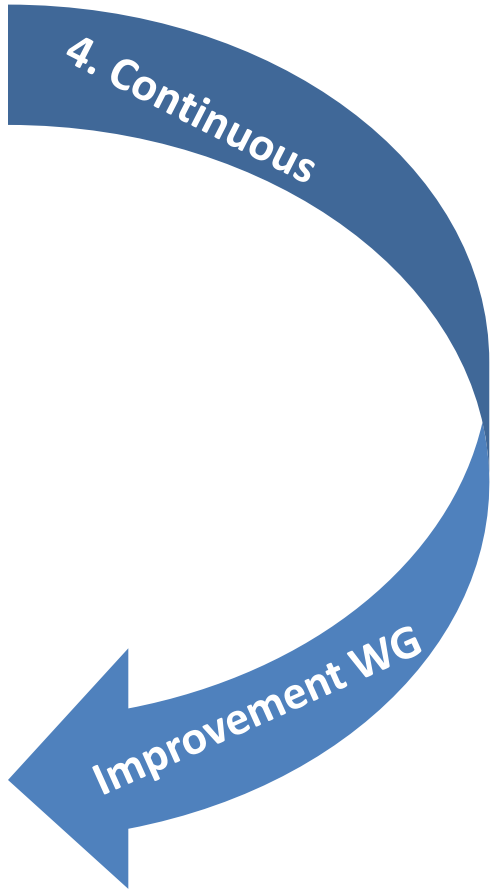
- TOP customer performance awareness
- Getting Connected revision
- Asset Transfer

2. Improve Quality of Contestable Builds

- Common Commissioning Snags
- Standards, Specifications, Due-diligence & Checklists
- Workshops with Customers / Contractors

3. Program Ownership by all Stakeholders

- Realistic Customer Programs
- ESB/EG Programs
- Interface Agreements / Connection Method



Questions and answers

SOEF Advisory Council Meeting #8

Housekeeping

- *Edel Leddin*

Housekeeping

- Future Meeting Calendar
- Actions from Previous Meeting/s
- Feedback from Advisory Council Members
- Advisory Council Member Survey (Jan 2024)
- Advisory Council Member Refresh

SOEF Advisory Council Meeting #8

Future Meeting Calendar

Meeting	Date / Time	Location
ACM #9	Tuesday, 24th September 2024	Dublin, Ireland
ACM #10	March 2025	TBC
ACM #11	June 2025	TBC
ACM #12	October 2025	TBC

Housekeeping

- Future Meeting Calendar
- Actions from Previous Meeting/s
- Feedback from Advisory Council Members
- Advisory Council Member Survey (Jan 2024)
- Advisory Council Member Refresh

ACM #8: Housekeeping

Actions from previous Meeting/s (1/x)

#	Topic	Action	Owner	Due	Status	Closing Notes
1	ACM Membership	TSOs to issue call for Expressions of Interest for Advisory Council Membership	TSOs	Q1 2024	Closed	Call issued 22 Feb 2024
2	ACM Membership	TSOs to provide update on ACM Membership refresh at upcoming ACM #8	TSOs	ACM #8	Closed	AC Member Refresh included in this presentation.
3	SOEF Cross-Programme Working Groups	AC Members to submit their ideas for the types of working groups that will benefit progression of the various SOEF programmes.	AC Members	Q1 2024	Closed	Three (3) responses received from Advisory Council.
4	SOEF Cross-Programme Working Groups	TSOs to update the Advisory Council on the establishment of cross-programme working groups.	TSOs	ACM #8	Closed	Cross-programme working will be established on an as-necessary basis. Other working groups will be established through ongoing programme delivery (e.g. monthly Future Power Markets Industry Workshops)

EirGrid SONI

ACM #8: Housekeeping
Actions from previous Meeting/s (2/x)

#	Topic	Action	Owner	Due	Status	Closing Notes
5	Sharing Models and Assumptions	TSOs to consider methods for joint developing and sharing models and assumptions. Was noted that this is a potential topic for a Working Group.	TSOs	ACM #8	Closed	Noted as potential working group topic. At this time, working groups will be established on an as-needed basis.
6	Delivery Challenges – Input from AC Members	AC Members asked to consider the questions posed during the SOEF v1.1 update and revert with their thoughts. Shown on slide 13 of the ACM #7 presentation: 1. How might we work together more in mitigation these challenges? 2. How can the Advisory Council Support?	AC Members	ACM #8	Closed	Three responses received. These are included in this presentation.
7	Draft ECP 3.2	Question posed by Member: In relation to the draft ECP2.3 constraints report. The results were provided in December 2023. One of the outcomes of this analysis is that it confirms that the ongoing network work is essential but also that there appears to be requirement for additional reinforcements/works to what was identified by SOEFV1.1. “Have the TSOs considered this?”	TSOs	ACM #8	Closed	Yes, the ongoing network changes are included in modelling assumptions.

EirGrid SONI

ACM #8: Housekeeping
Actions from previous Meeting/s (3/x)

#	Topic	Action	Owner	Due	Status	Closing Notes
8	SOEF Working Group suggestion	Member suggested “Grid forming technology” as potential working group for SOEF. TSOs to consider.	TSOs	ACM #8	Closed	Working groups will be established on an as-needed basis. This is captured in the “Working Group” pipeline.
9	SOEF Working Group suggestion	Member suggested “Future EU Electricity Market Design” as potential working group for SOEF. TSOs to note as potential topic for Working Group.	TSOs	ACM #8	Closed	Working groups will be established on an as-needed basis. This is captured in the “Working Group” pipeline.
10	Member participation in HV Interface Forum	Re: Member involvement in HV Interface Forum. TSOs committed to take Member’s comment back to the HV Interface Forum for consideration.	TSOs	ACM #8	Closed	This was taken back for consideration by the TSO team involved in the HV Interface Forum. Additional HV Interface forum engagement at this ACM #8 meeting.
11	Customer Connection Feedback and Learnings	Re: Customer connections challenges: Member expressed desire for sharing learnings & feedback in both directions. TSO (EirGrid) committed to taking this suggestion back to the customer connection teams for consideration	TSO (EirGrid)	ACM #8	Closed	This was taken back and fed to the customer connection team.

EirGrid SONI

ACM #8: Housekeeping
Actions from previous Meeting/s (4/x)

#	Topic	Action	Owner	Due	Status	Closing Notes
12	Markets Programmes Value Assessment	Advisory Council Members are asked to take away the markets programmes information and provide input on whether these were the right list of programmes and on the programmes' value and complexity from their perspective	Members	3 weeks from distribution of slides	Closed	Three responses provided. Information provided in this presentation.
13	Markets Programmes Value Assessment	TSOs to receive and analyse AC Member responses. TSOs to revert at or before next ACM (#8).	TSOs	ACM #8	Closed	Three responses received. Information included in this presentation.
14	Markets Programmes Value Assessment	Advisory Council Members are asked to consider the two questions posed in the workshop: 1. Q1: Can the industry support delivery of multiple large market change programmes? 2. Q2: Does this list miss any markets change programmes?	Members	ACM #8	Closed	Three responses received. Information included in this presentation.

EirGrid SONI

ACM #8: Housekeeping

Actions from previous Meeting/s (5/x)

#	Topic	Action	Owner	Due	Status	Close notes
15	Programme Approval and Funding	Members and TSO are asked to consider and respond to the following questions posed by an Advisory Council Member: 1. "Is the current system of proposing and approving programme funding fit-for-purpose for the scale and speed of change? 2. Could industry author/co-author a proposed way forward for efficient programme approval and funding?"	Members TSOs	ACM #8	Closed	Three responses received. Information is included in this presentation.
16	Integrated Markets Plan	During the Markets Update, the TSOs posed a question to members: 1. Can the Advisory Council provide guidance as to how we can develop such a shared integrated plan?	Members	ACM #8	Closed	Three responses received. Information is included in this presentation.
17	EirGrid / ESB Networks TSO-DSO Operating Model	Members requested that EirGrid and ESB Networks consider publication of an information paper to set out the thinking and work done to date with conceptual worked examples to support understanding of the potential impacts.	EirGrid ESB Networks	ACM #8	In Progress	This is in progress.
x	Improving the Consultation Process	Member asked to author a presentation on how the consultation process could be improved.	Member (Jag Bassi)	ACM #8	Closed	Included in ACM #8 pre-read and will be discussed during the meeting.

Housekeeping

- Future Meeting Calendar
- Actions from Previous Meeting/s
- Feedback from Advisory Council Members
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- Advisory Council Member Refresh

ACM #8: Member Feedback

QUESTION 1: Working Groups (Xref Action #3)

AC Members to submit their ideas for the types of working groups that will benefit progression of the various SOEF programmes.

Response 1 of 2

We support the set-up of cross-programme working groups and suggest SOEF members can nominate suitable people from within their businesses to attend. We believe this approach will help:

1) Eirgrid/SONI receive targeted support from Subject Matter Experts within industry
2) Ensure interactions across work areas are clearly recognised, assessed and actively managed

We agree working groups are organised by key themes as has been proposed.

Under functional groups we recommend careful consideration is given to security of supply, as well as renewables over supply. Green hydrogen and energy storage solutions (in general) are key to these areas. An objective assessment of the technology risk associated with delivering the scale of storage solutions required to deliver the 80% RES-E target should be a high priority.

We observe Irish energy policy is recognising a growing role for hydrogen in decarbonisation, mirroring wider EU and GB policy, and we expect this to also be mirrored in future NI energy policy. This will require increasing collaboration between the electricity and gas sectors, which is reflected in the call for more representation from the gas industry on the Advisory Council.

We also welcome recognition of the need to increase representation from the transport sector. Decarbonisation impacts the whole of the energy system and cannot be achieved without increasing cross sectorial collaboration.

ACM #8: Member Feedback

QUESTION 1: Working Groups (Xref Action #3)

AC Members to submit their ideas for the types of working groups that will benefit progression of the various SOEF programmes.

Response 2 of 2

I propose a working group on Modelling for SOEF and Future Market, and dissemination of the data.

Of particular interest of Demand consumers would be:

- How much opportunity is there from over generation and dispatch down.
- What mitigation options are considered. Interconnectors, long duration battery, demand movement, direct electrification of heat, Thermal Storage, Electric Vehicles.
- Can member propose a technology to model?

EirGrid SONI

ACM #8: Member Feedback

QUESTION 2: Delivery Challenges (Xref Action #6)

AC Members asked to consider the questions posed during the SOEF v1.1 update and revert with their thoughts. 1) How might we work together more in mitigating these challenges? 2)How can the Advisory Council Support?

Response 1 of 3

The Advisory Council could input and support the development of an SOEF high level macro costing for the scenarios in timeframes to 2030 and beyond to decarbonisation that recognises import of electrification of energy. This cost estimate would cover an estimated cost of energy served per unit (inclusive of tariffs). The cost of prudent large investments should be ameliorated by growth in electricity usage. On the benefit side is climate policy and targets addressed and a corresponding reduction in fossil fuel spend on heat and transport etc. This should enable an investment context beyond a 4/5 year electricity cost and tariff cycle with competing consumer costs (e.g. gas tariffs) and a potential lack of cognisance of reduced spend outside the traditional electricity sector.

The suggested areas for macro spend forecasting would be (TBD):

1. Network Spend
2. System Services
3. Market Systems
4. Innovation – not a traditional but an essential

Within this envelope/context big ticket investments could be made with less focus on the near term impacts and more on the long term with due consideration of the benefits (e.g. free fuel that renewable integration represents).

If this were endorsed by an Advisory Council and kept current then it could be complementary to what is there today in the Regulatory Approvals area.

EirGrid SONI

ACM #8: Member Feedback

QUESTION 2: Delivery Challenges (Xref Action #6)

AC Members asked to consider the questions posed during the SOEF v1.1 update and revert with their thoughts. 1) How might we work together more in mitigating these challenges? 2)How can the Advisory Council Support?

Response 2 of 3

The Governments Climate Action Plan goals are to achieve 51% decarbonisation by 2030 and reduce our reliance on imported fossil fuels.

The electricity sector has problems with excess variable zero carbon energy.

Heat and transport have limited options to move away from fossil fuels.

There are relatively low cost opportunities to replace fossil fuels, fast and at scale in the industrial heat sector by offering the service to absorb excess RESe generation.

Renewable led electrification and signals for demand-turn-up are needed.

EirGrid SONI

ACM #8: Member Feedback

QUESTION 2: Delivery Challenges (Xref Action #6)

AC Members asked to consider the questions posed during the SOEF v1.1 update and revert with their thoughts. 1) How might we work together more in mitigation these challenges? 2)How can the Advisory Council Support?

Response 3 of 3

I think it is fair to say that the scale and rate of change being attempted in the electricity sector (and wider energy sector) is unprecedented.

Suggest it is therefore important for Eirgrid/SONI to be upfront with the Advisory Council on what the delivery risk for work areas are in relation to 2030 timelines and to objectively assess the consequences of non-delivery with reference to each jurisdiction's 2030 targets, climate action plans, and longer-term decarbonisation commitments.

While appreciating the primary focus of SOEF is the 2030 targets this approach would reflect the previous calls for the remit of the group to also look beyond 2030. This at least facilitates a rounded debate on prioritisation and the development of a deliverable programme of works but expect it will require some uncomfortable and difficult decisions. Governance arrangements should therefore be looked at. Particularly in relation to decisions regarding prioritisation of deliverables – how prioritisation is agreed.

It may also be helpful to review the governance role for relevant government departments and regulators within the group with regards to how work is prioritised. Government will have to accept the implications of prioritisation (impact of delayed workstream on delivery of decarbonisation goals), while regulators will need to ensure appropriate funding is available to deliver upon prioritised work.

EirGrid SONI

ACM #8: Member Feedback

At previous AC Meetings the TSOs received feedback that we are focusing on the wrong markets programmes e.g. too much focus on compliance vs value.

We presented a multi year view of possible market changes and sought feedback from the ACM on whether we were focusing on the right areas.

We received 3 responses from the ACM and the feedback summary is:

- View that there is too much focus on compliance vs value. An example is that the GB trading arrangements are more important that EU regulations
- The only missing aspect noted was demand turn up (note this is proposed as part of the Balancing Market Reform component of the Strategic Markets Programme)
- Approval for funding is too onerous
- Proposal that the ACM could have a role in relation to establishing a macro proposal to the RAs on priority items and look beyond the 5 year cycle

EirGrid SONI

ACM #8: Member Feedback

QUESTION 3: Markets Programmes Value Assessment (Xref Action #12)

Advisory Council Members are asked to consider the markets programmes and develop their viewpoint on value and complexity for the programmes.

Response 1 of 2

In relation to market programmes we believe delivering all the change identified in the time-period available is extremely challenging and recommend a similar prioritisation approach is adopted for market programmes as outlined in relation to topic 6 above.

Some specific observations on market arrangements are:

1. Full EU integration presumably requires significant SEM market redesign. Will this market redesign also significantly assist delivery of NI/ROI 2030 decarbonisation targets? If the answer to this question is no, it could be worth investigating whether full integration could potentially be delayed until post 2030 – e.g. minimal change arrangements put in place to facilitate trading on Celtic.
2. If full EU integration is required to successfully commission Celtic, it would seem sensible to wrap balancing market reform up into the wider market redesign that will need to be carried out. If full integration however can be delayed, some elements of balancing market reform may also be able to be delayed until the wider market redesign process.
3. We expect market coupling between GB and SEM may have a greater potential impact on delivery of 2030 targets than integration between EU and SEM. This is on the basis of the installed interconnection capacity – i.e. SEM will have 1.5GW of interconnection with GB but only 0.7GW of interconnection with EU. Subject to 2, a study should be carried out to determine whether it is best to prioritise SEM market coupling with GB or EU in the short term.

As a general comment, noting the extent of changes to market arrangements that seem to be required, pursuing complex bespoke designs / IT requirements should be avoided and approaches consistent with 'typical' solutions used in other markets adopted as much as possible. Highly bespoke solutions tend to increase cost and delivery timeframes, as well as cause issues for ongoing management of systems, including future augmentation. This could be an important consideration for FASS for example.

EirGrid SONI

ACM #8: Member Feedback

QUESTION 3: Markets Programmes Value Assessment (Xref Action #12)

Advisory Council Members are asked to consider the markets programmes and develop their viewpoint on value and complexity for the programmes.

Response 2 of 2

Consideration need to be given to what Market programs will best help to deliver 51% decarbonisation by 2030 and reduce our reliance on imported fossil fuels.

	Project	Benefit (5 = Most Benefit)	Complexity (5 = Least Complex)	Score
1	Greenlink Interconnector	1	2	3
2	Tariffs	5	4	20
3	Future Arrangements System Services	3	2	6
4	Strategic Markets Programme (Full Int. of the SEM into GB and EU Mkts)	1	1	1
5	Long Duration Energy Storage (LDES)	2	3	6
6	NI Renewable Energy Support (RESS)	5	4	20
7	CRM Post 2027	2	5	10
8	Scheduling & Dispatch	4	3	12
9	LCIS	4	4	16

EirGrid SONI

ACM #8: Member Feedback

QUESTION 3: Markets Programmes Value Assessment (Xref Action #12)

Advisory Council Members are asked to consider the markets programmes and develop their viewpoint on value and complexity for the programmes.

Response 2 of 2 contd.

Consideration need to be given to what Market programs will best help to deliver 51% decarbonisation by 2030 and reduce our reliance on imported fossil fuels.

	Project	Narrative
1	Greenlink Interconnector	Unsure if SoS is improved, unsure if dispatch down is improved or made worse. The UK is installing a lot of wind and solar, it has a similar weather pattern to Ireland and has a more volatile market price.
2	Tariffs	Legacy tariff methodology lock in our reliance on fossil fuels. Tariffs alone cost more per MWh than gas. Time of Use tariffs are of little use when we have 22GW of RESe. We need RESe following tariffs.
3	Future Arrangements System Services	The service is needed, the service must transition to 100% fossil fuel free. Long term investor signal needed and simpler design. Risk from over compliance with EU legislation
4	Strategic Markets Programme (Full Int. of the SEM into GB and EU Mkts)	Unsure if there is much benefit to decarbonisation or reduction of fossil fuels. Risk from over compliance with EU legislation

EirGrid SONI

ACM #8: Member Feedback

QUESTION 3: Markets Programmes Value Assessment (Xref Action #12)

Advisory Council Members are asked to consider the markets programmes and develop their viewpoint on value and complexity for the programmes.

Response 2 of 2 contd.

Consideration need to be given to what Market programs will best help to deliver 51% decarbonisation by 2030 and reduce our reliance on imported fossil fuels.

	Project	Narrative
5	Long Duration Energy Storage (LDES)	Unsure about mitigate against oversupply. Unsure about reducing carbon emissions. https://www.seai.ie/documents/research-projects/RDD-000326.pdf "Conclusion 8 Energy limited storage technologies, such as batteries and pumped storage, have limited direct curtailment mitigation benefits on a high wind system. While conventional storage (battery and pumped hydro) has very little direct impact on curtailment, these technologies do have other potential system benefits that should be explored further, including providing fast frequency response, reserves, ramping and reactive power services, as an alternative to fossil fuelled peaking capacity and as a potential solution to local grid constraints." SOEF v1.1 was not clear on the MWh benefit or carbon benefit of volume limited batteries. Ability to issue negative dispatch instruction is critical to demand turn up services. This work should not exclude certain technology, it should include demand turn up service to facilitate electrification of heat.
6	NI Renewable Energy Support (RESS)	important
7	CRM Post 2027	Vital to generation adequacy. Capacity reserve should not be restricted by emission limits if only used for a few hours.

EirGrid SONI

ACM #8: Member Feedback

QUESTION 3: Markets Programmes Value Assessment (Xref Action #12)

Advisory Council Members are asked to consider the markets programmes and develop their viewpoint on value and complexity for the programmes.

Response 2 of 2 contd.

Consideration need to be given to what Market programs will best help to deliver 51% decarbonisation by 2030 and reduce our reliance on imported fossil fuels.

	Project	Narrative
8	Scheduling & Dispatch	Energy Storage Power Station (ESPS) Integration: Should not be technology specific, demand turn up participants are excluded from demand turn up service in the current drafting. Not compliant with CEP of non-dissimilatory market access. Priority and non-priority dispatch RESe: Risk from over compliance with EU legislation
9	LCIS	It this will reduce must run fossil fuel units then it scores well.

EirGrid SONI

ACM #8: Member Feedback

QUESTION 4: Markets Programmes Value Assessment (Xref Action #14)

Advisory Council Members are asked to consider the two questions posed in the workshop. 1) Can the industry support delivery of multiple large market change programmes? 2) Does this list miss any markets change programmes?

Response 1 of 1

We see no reason industry cannot adapt to multiple large market change programmes so long as they are coordinated.

The list is missing demand turn up service which is available from the heat sector.

This can offer a mitigation option against oversupply at a fraction of the cost other technology.

In addition, it can displace fossil fuel usage in the heat sector.

EirGrid SONI

ACM #8: Member Feedback

QUESTION 5: Programme Approval and Funding (Xref Action #15)

Members and TSO are asked to consider and respond to the following questions posed by an Advisory Council Member. 1) “Is the current system of proposing and approving programme funding fit-for-purpose for the scale and speed of change? 2)Could industry author/co-author a proposed way forward for efficient programme approval and funding?”

Response 1 of 3

We are aware that the Regulators must follow due-process and must represent the best interest of citizens. However, Regulatory restrictions can be penny wise but pound poor.

Savings in areas such as DS3, Capacity and system changes can have disproportionately higher costs elsewhere and at different timelines. The Irish government has already made legally binding commitments to achieve 2030 decarbonisation targets.

Any wastage of indigenous energy in the electricity sector will have to be made up elsewhere at a much more elevated cost by other less sustainable technology. Any slow progression by the electricity sector will make carbon reduction much more severe in later years under the carbon ceiling calculation method.

The biggest risk to society is slow and restrictive action from the electricity sector.

Over procurement or early delivery of excess DS3, Capacity or other service is not a bad thing, it would not register on a regret analysis.
Under procurement and late delivery we have seen is damaging to the Irish economy; it could also damage the cohesive working relations between the Regulated and the Regulators.

I believe the TSOs must be empowered by the Regulators to move fast, learn fast, fail fast. Then deliver.

ACM #8: Member Feedback

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Response 2 of 3

We do not think the current approval and funding mechanisms seem to be operating with the efficacy and speed required to deliver the extent and pace of change necessary to deliver upon decarbonisation targets.

Recognising the need for good governance and responsible fiscal controls, the challenging timelines require more responsive/dynamic protocols to allow progress to be made quickly on the ground in key areas.

Joint drafting could be difficult to agree and therefore it may be more pragmatic to provide a means for industry to quickly indicate its support or otherwise for programmes and funding submissions drafted by Eirgrid/SONI.

Working groups should provide a mechanism to facilitate broad agreement with industry on requirements in key areas.

Appreciating not everyone will get what they want, or think is required, work prioritisation and governance arrangements are likely to be important.

EirGrid SONI

ACM #8: Member Feedback

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Response 3 of 3

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The suggested areas for macro spend forecasting would be (TBD):

- Network Spend
- System Services
- Market Systems
- Innovation – not a traditional but an essential

Within this envelope/context big ticket investments could be made with less focus on the near term impacts and more on the long term with due consideration of the benefits (e.g. free fuel that renewable integration represents).

If this were endorsed by an Advisory Council and kept current then it could be complementary to what is there today in the Regulatory Approvals area..

EirGrid SONI

ACM #8: Member Feedback

QUESTION 6: Integrated Markets Plan (Xref Action #16)

During the Markets Update, the TSOs posed a question to members: Can the Advisory Council provide guidance as to how we can develop such a shared integrated plan?

Response 1 of 1

The most pragmatic way to determine a markets plan is to agree criteria that can be used for prioritisation of the relevant work areas. Assuming there is objective scoring of work areas relative to those criteria it then provides an evidential basis for identifying an optimal plan.

This answer is predicated on the assumption it is unlikely to be possible to deliver all identified work areas ahead of 2030.

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Housekeeping

- Future Meeting Calendar
- Actions from Previous Meeting/s
- Feedback from Advisory Council Members
- Advisory Council Member Survey (Jan 2024)
- Advisory Council Member Refresh

Advisory Council Member Survey Results (Jan 2024)

What We Learned / Heard	What We're Doing
Insufficient lead time for materials	For ACM #8, and for future ACMs, the scheduled date for publication of pre-read materials is 14 calendar days in advance.
Too much time is currently spent on updates. Members want more discussion time. The value of the Advisory Council is the discussion time and input from Advisory Members.	For ACM #8, and for future ACMs, the agenda provides 60 minutes for SOEF status update discussion. Pre-read materials will be provided in advance, and 60 minutes will be used for Member Q&A. The format for the ACM will continue to focus on Member discussion time.
Workshops are very helpful – more time for these activities is requested.	We are continuing to utilize the "focus group" format. For ACM #8 we are expanding the time allocated to this.
A more formal action tracking log would be useful	Actions are currently included in the AC Meeting minutes.
Timekeeping in the meeting must be better managed.	We will improve timekeeping in the meetings.

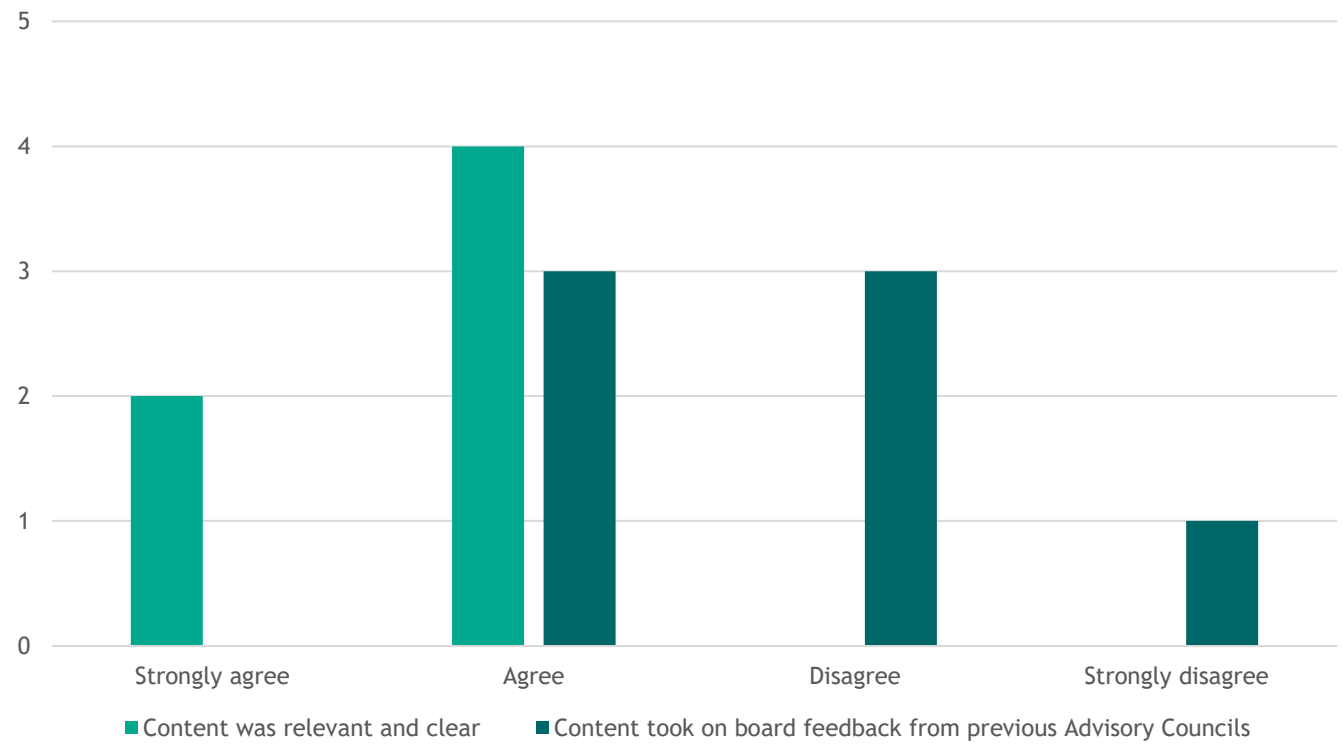
EirGrid SONI

Individual feedback analysis

The structured “agree or disagree” answers are represented in the following section.

Feedback on presentation content

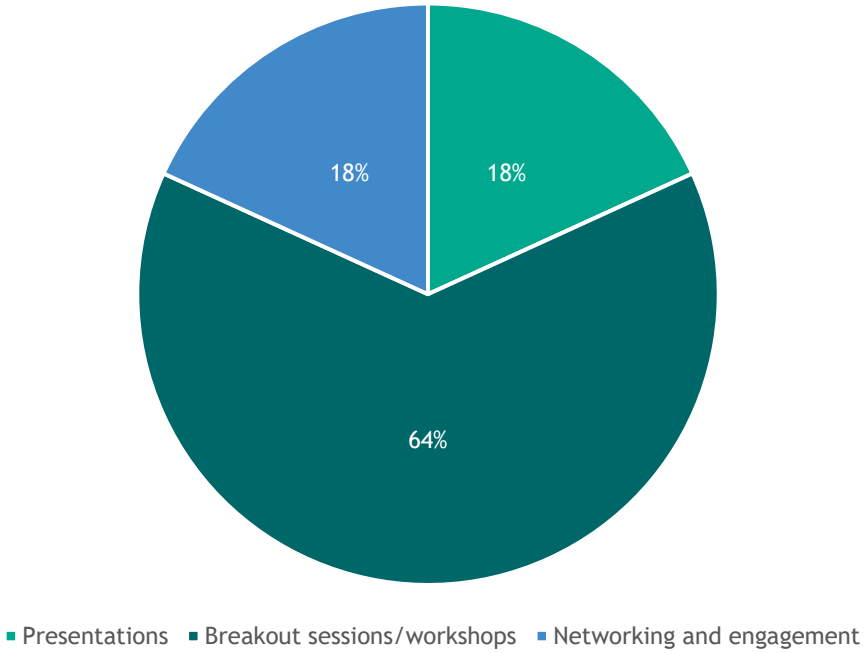
Presentation content was considered relevant and clear, but less responders agreed the content takes on board feedback from previous advisory councils.



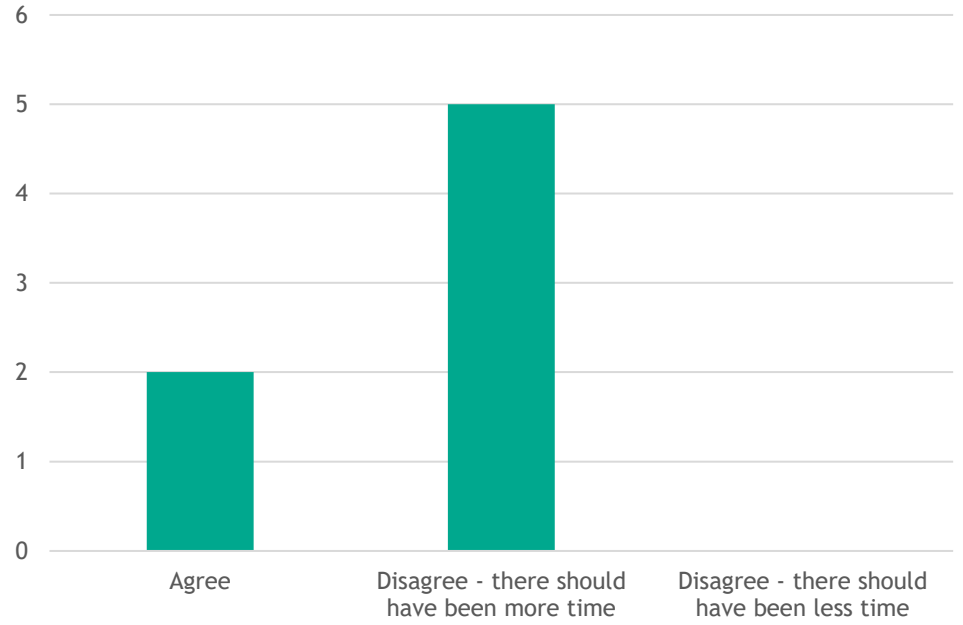
Potential changes to future SOEF Advisory Councils

The majority of responders selected that they would like more break-out sessions and workshops. Feedback indicated in both free-text comments and below structured answers that more time is required.

What would you like to see more of in future SOEF Advisory Councils?

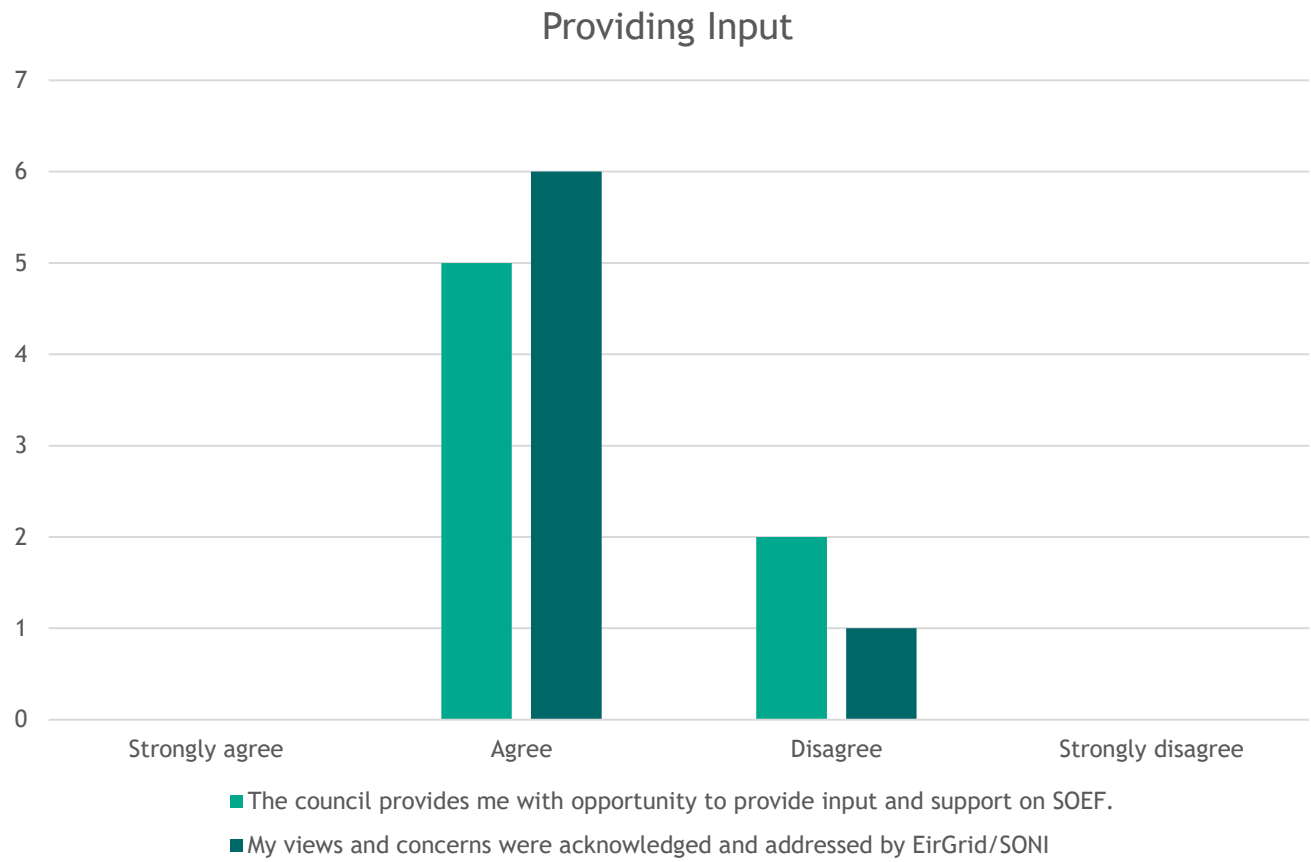


There was adequate time for each presentation and workshop, including time for comments and questions



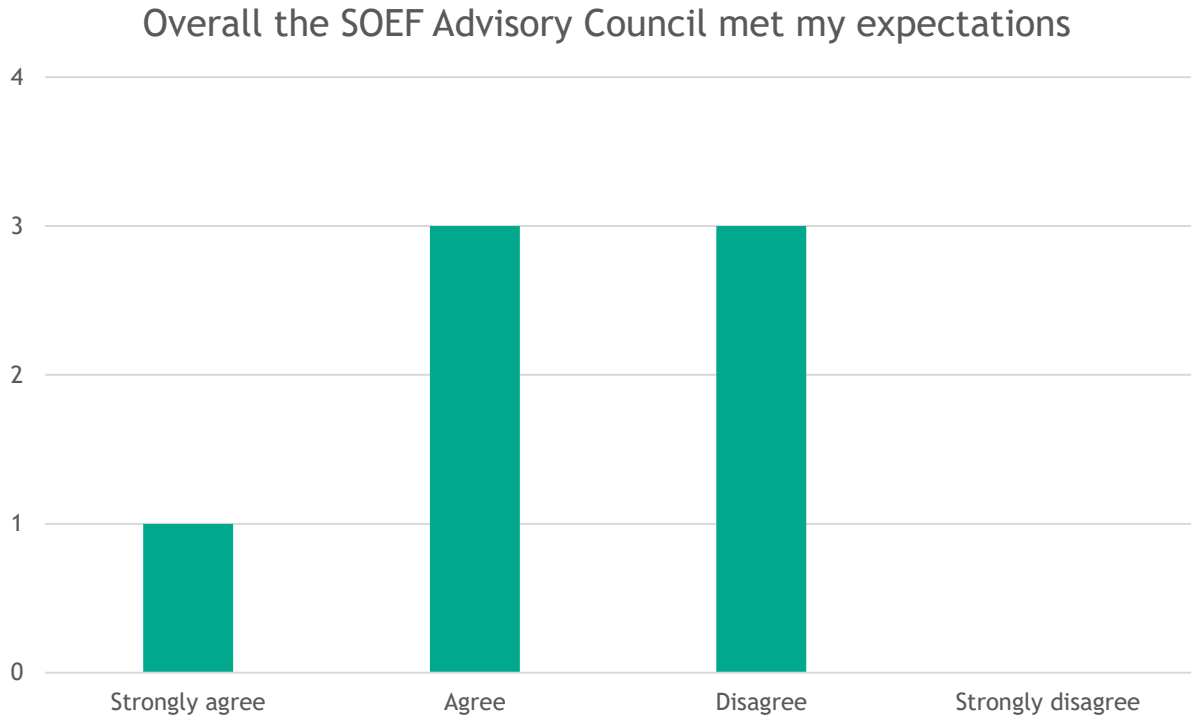
Opinions around providing input

Survey responders largely agreed that they are provided with the opportunity to provide input and support, and that their views and concerns are acknowledged and addressed.



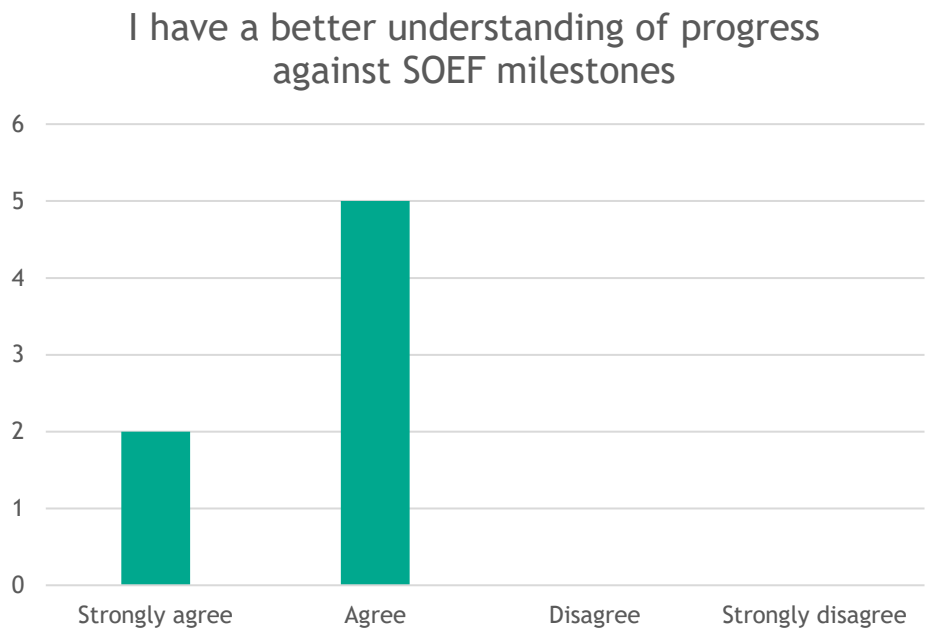
Overall, the SOEF Advisory Council met my expectations

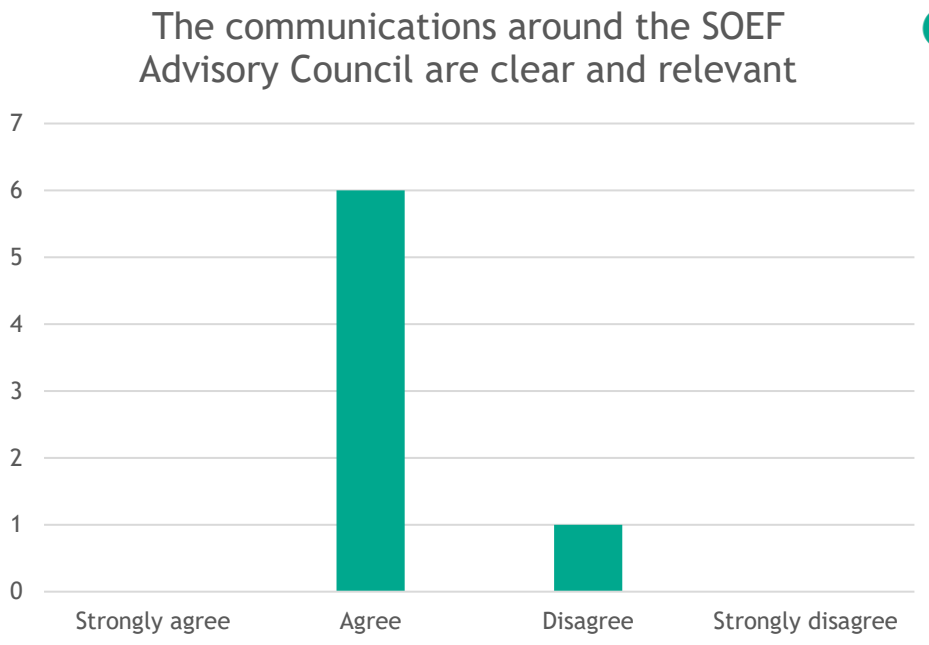
There is room for improvement, with responders showing only a slight positive trend.



Other

The below graphs show that the SOEF Advisory Council left all responders feeling more informed of EirGrid and SONI's progress against milestones, and that the communications around the Council both before and after are relevant to SOEF.





Housekeeping

- Future Meeting Calendar
- Actions from Previous Meeting/s
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AC Member Refresh

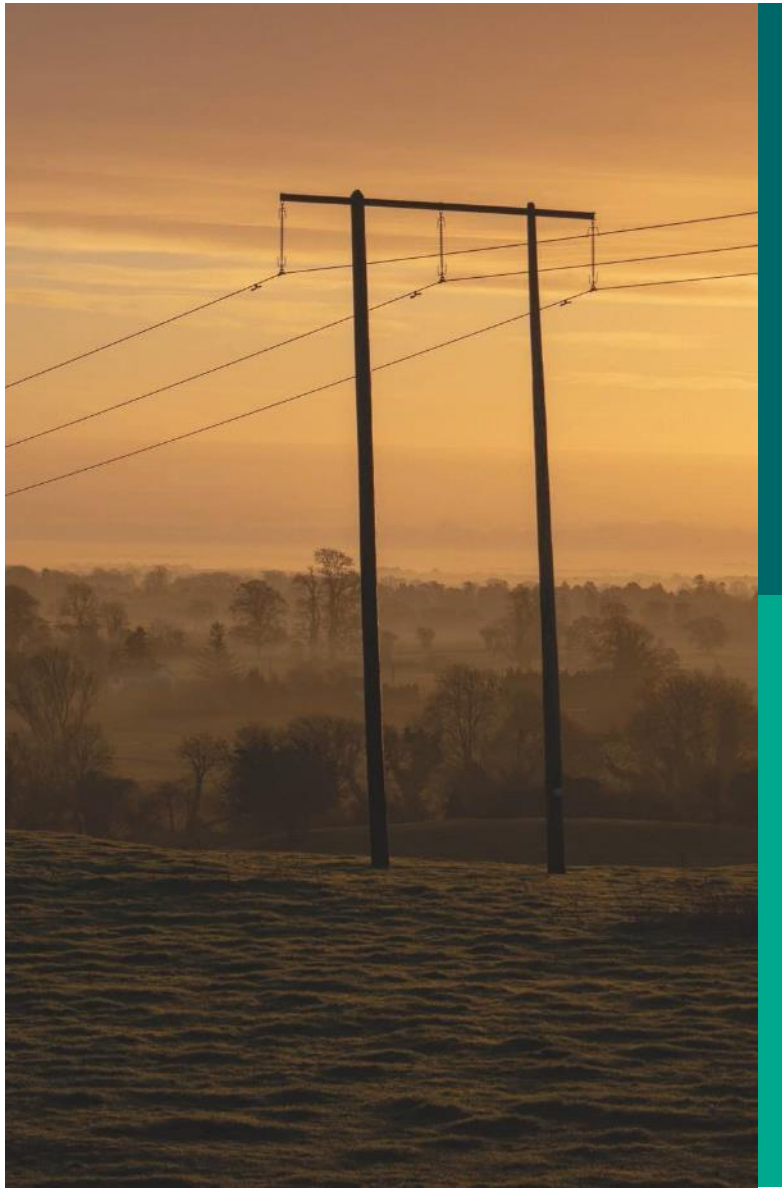
47
EOIs Received

19 Current AC Members

28 New Applicants

Sector Distribution

- Renewables
- LEUs
- Conv. Gen.
- New Tech.
- Dem. Resp.
- Storage
- Gas Networks
- Utilities
- Consulting



EirGrid SONI

Overview: SOEF Advisory Council Membership Refresh

We are here

Timeline for SOEF AC Membership Refresh

Background and Objectives

The SOEF Advisory Council will open for expressions of interest from those who would like to become Members of or renew their Membership in the SOEF Advisory Council.

The Advisory Council aims to provide a stable engagement framework for meaningful discussion around the energy transition with varied participation to represent market, demand, research and policy perspectives. ***Membership Refresh has several objectives***:

1. To ***maintain a diverse and influential representation*** on the Advisory Council that is relevant, timely, and adaptive towards emerging issues.
2. To ***reaffirm in-person attendance*** as the preferred mode of engagement and encourage Advisory Council members to plan for and commit to these dates.
3. To ***renew the commitments*** of the Advisory Council members to the engagement platform and renew key principles and terms of reference.
4. To offer existing members the opportunity to decline engagement in future Council meetings amidst competing priorities.

Key Principles

Membership Composition

- Existing Members can re-apply; some are likely to be exited.
- New Members will be sought.
- Goal is to maintain a diverse, active, and influential group of Advisory Council Members.

Communication Timing

- Communicate decision ***after*** the 21 May ACM #8.
- General email to returning and new Members.
- Personalised emails to exiting Members.

Sufficient Time

- Provide sufficient time for potential/returning Members to submit EOI.
- Allow for time to review, evaluate, and consider Membership.

SOEF Advisory Council Meeting #8

Closing Messages

- *Alan Campbell*
- *Eoin Kennedy*

Future Power Markets

SOEF Advisory Council

May 2024

Achievable – Valuable – "Simple"

Future Power Markets

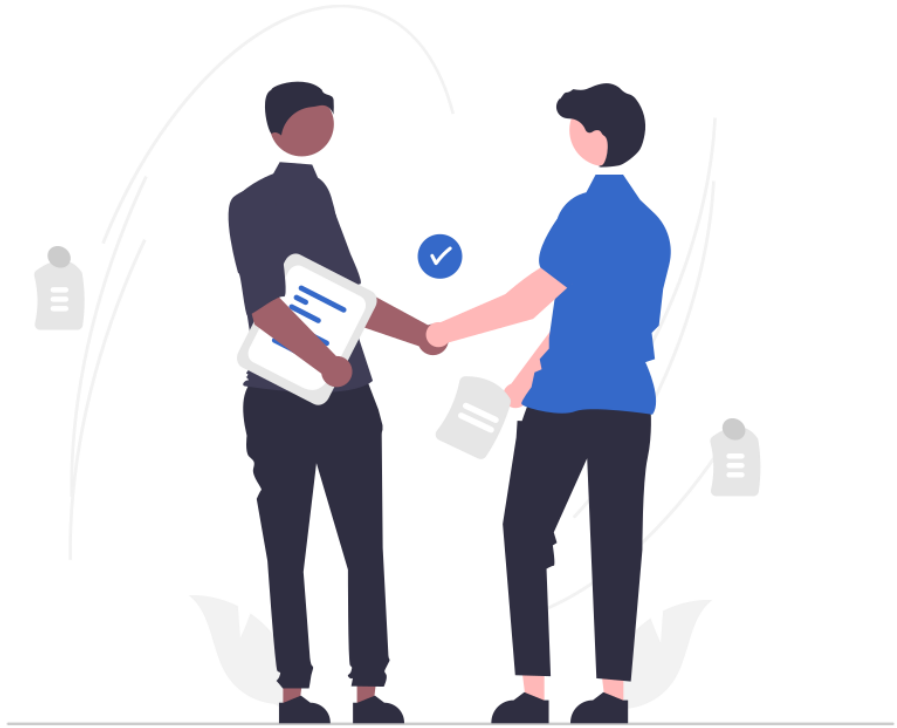
Engagement Channels

1. **Monthly Workshops** – we are facilitating a monthly workshop (hybrid of in person and online) to discuss the various inflight programmes. A schedule of dates through to the end of the year has been communicated.

2. **Monthly Newsletter** – published each month with progress updates, links to relevant information and details on other relevant policy updates.

3. **Deep Dive Sessions** – when required we will facilitate more indepth sessions. For example, a deep dive on worked examples in relation to the Future Arrangements for System Services proposed daily auction design.

4. **Email Addresses** – each inflight programme has a dedicated email address for queries.



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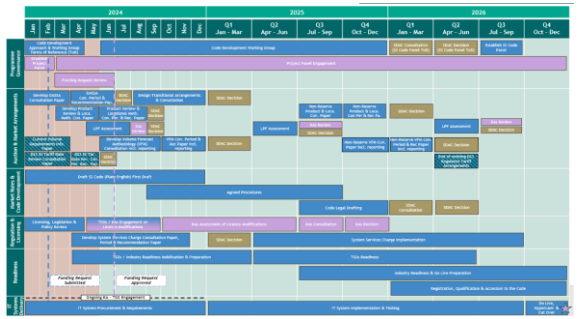
Future Arrangements for System Services

Phased Implementation Roadmap:



- This was approved by the SEMC and published by the TSOs in March
- A significant number of items are being paralleled to expedite delivery

Daily Auction Design:

- There is a level of complexity associated with moving from regulated tariff arrangements to daily auctions
- There has been engagement with industry over the past c. 18 months in relation to the detail of the DASSA arrangements via bilateral meetings, industry workshops with our independent advisors DotEcon / Afry and the publication of a paper from Dotecon/AFRY
- The DASSA consultation was published on 15 March and closes on 24 May (2 week extension granted by TSOs and RAs)
- To further aid market participants, the TSOs facilitated a workshop on 24 April to run through some worked examples and have been publishing FAQs

Risks:

- Need to avoid any further delays to consultation closing to allow time for SEMC to review recommendations paper.

Scheduling & Dispatch

- We welcome the approval of the funding from the RAs, which came across in March 2024

- The programme continues at pace and we have published the go-live dates for both Tranche 1 (April 2025) and Tranche 2 (October 2025)

- Over the coming months we will be ramping up our readiness programme to ensure participants are fully briefed on the impacts of these changes

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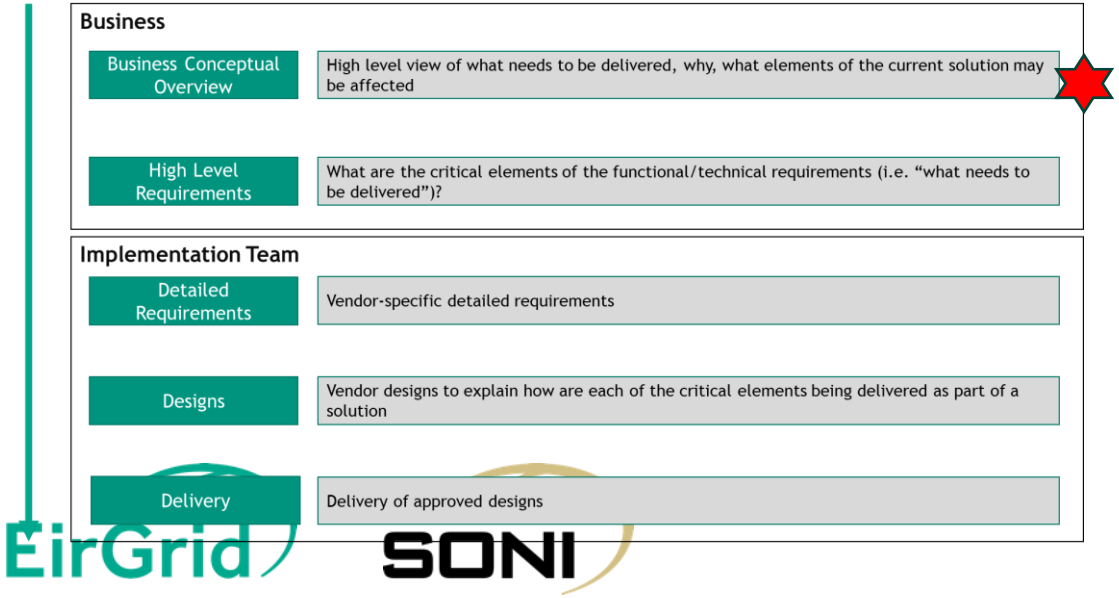
Strategic Markets Programme
Balancing Market Reform

- We are at the early phases of this programme and are scoping out what needs to be included within this release. Examples of initiatives at present are:
  - *Enduring solution for Energy Storage Power Stations (beyond "Follow PN");*
  - *This should include solutions for long duration energy storage (e.g., > 100 hours);*
  - *Dispatch up of demand – instructing participants to increase consumption (e.g., for electrode boilers, hydrogen electrolysers, etc.);*
  - *Enduring solution treatment of Non-Priority Dispatch Renewables (grandfathering of constraints, i.e., apply commercial offers in constraint management);*



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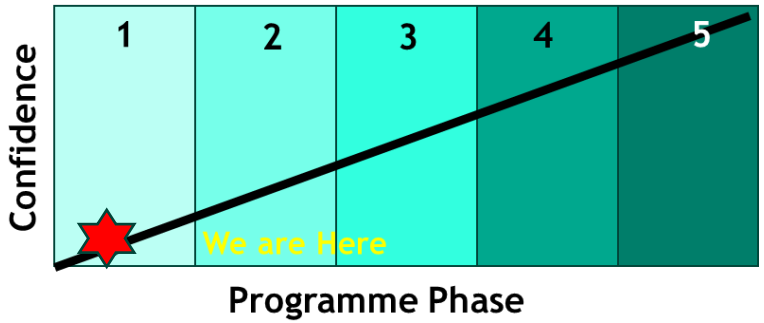

System Operations

SOEF Advisory Council

May 2024

Operational Policy Roadmap - Status Update

1. **Dynamic Stability**
   - 7 units MUON* trial completed and operating under enduring policy
   - 80% SNSP study has begun

2. **Ramping & Reserves**
   - Trial of Increased All-Island HVDC Ramp Rate has begun

3. **Operational Security**
   - Further review of South TCGs (Transmission Constraint Groups) has begun, taking into account system changes and impact of Greenlink Interconnector
   - Further review of Dublin TCGs planned for September 2024
   - Review of the NI Security of Supply TCG is ongoing

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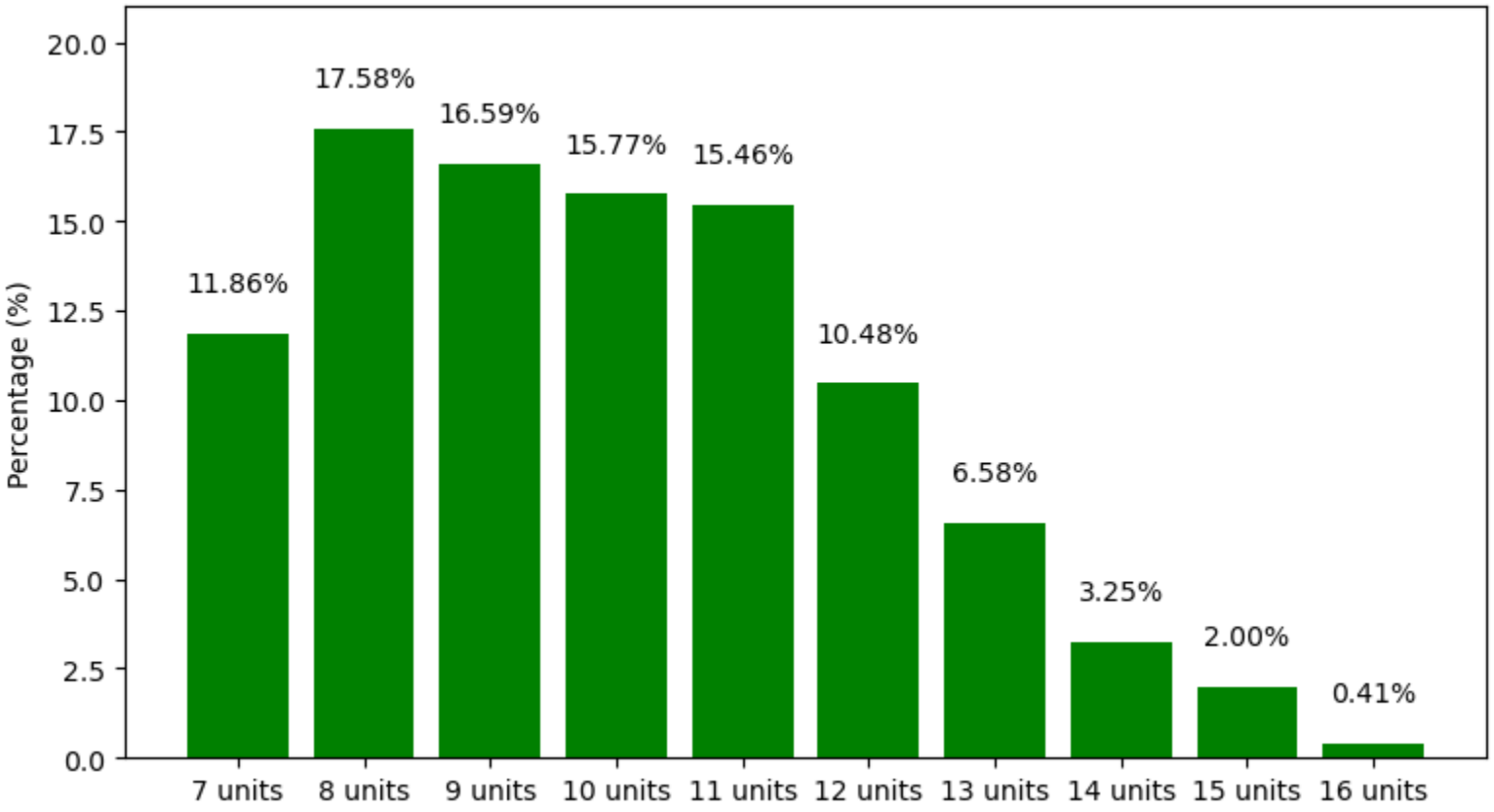
* MUON: Minimum number of Units ON

Min 7 Operational Policy Update

The trial of operation with a reduced minimum requirement for large synchronous generators, from 8 to 7 ('Min 7'), commenced on 30 May 2023.



Month	Hours operating with 7 units
May 2023	0
June 2023	12
July 2023	32
August 2023	34
September 2023	72
October 2023	89
November 2023	1
December 2023	265
January 2024	107
February 2024	110
March 2024	109
April 2024	122
Total	**722**

Min 7 Operational Policy Update

A series of snapshots was used to perform rigorous analysis on the Min 7 trial for the period of 30 May to 31 December 2023.

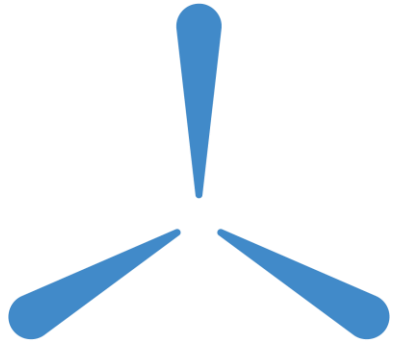
This included:

- Frequency Stability Analysis
- Rotor Angle Stability Analysis
- Voltage Security Analysis

This analysis was presented to the TSOs' Operational Policy Review Committee for review and approval.

RESULTS AND ACTIONS

- The power system was operated with 7 units for 722 hours during the trial which commenced on 29 February 2024
- Trial analysis indicated that the power system could be operated securely with a reduction in the minimum number of units constraint from 8 to 7.
- Some power system issues remain challenging to manage e.g. North-South system separation and data centre response to faults. The TSOs continue to monitor and consider mitigations for these issues.
- 'Min 7' became enduring policy from 7 April 2024



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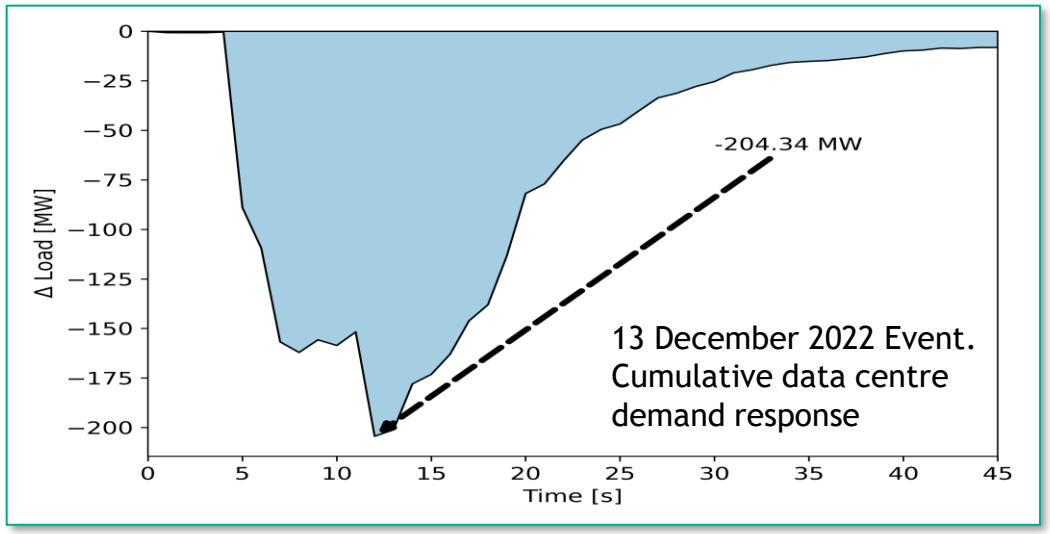
SEMO week 22 Operational Constraints Report - Indicating trial kick-off

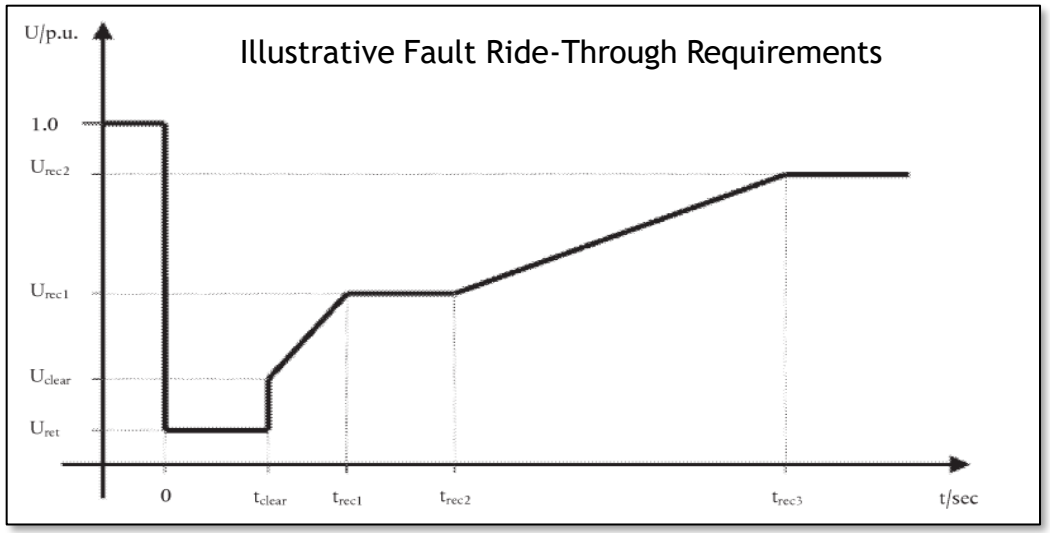
Large Energy User (LEU) Protection Settings

The TSOs held a data centre industry webinar on 30 April 2024 to ensure industry awareness of the issues and to set out proposals for next steps. In summary:

- The demand response of multiple data centres to a fault on the power system continues to present challenges to the resilience and stability of the power system.
- Sensitive protection settings (Under/Over Voltage, Under/Over Frequency, Rate of Change of Frequency) on data centre electrical systems are driving this response.
- The TSOs are requesting the support of the data centre industry in the establishment of a Task Force focused on resolving this matter – our aim is to kick this off before the end of May 2024.

Pending resolution of these issues, there is a risk to the timely delivery of further steps on our Operational Policy Roadmap (e.g. SNSP increases, Min. No. Units reductions).





TSO-DSO Engagement

Jurisdictional TSO-DSO work programmes are in place between EirGrid / ESB Networks in Ireland and SONI / NIE Networks in Northern Ireland.

A key pillar of both TSO-DSO work programmes is to develop a TSO-DSO future operating model that sets out the vision and principles for collaboration, data exchange, operational interfaces, and protocols into the future.

EirGrid / ESB Networks Future Operating Model

- Engagement between the SOs is ongoing to discuss detailed design and agree an implementation plan for the high-level design.
- Introductory webinars for industry stakeholders are to be scheduled in the coming weeks. These sessions will provide background on the current working of the system and an overview of the operating model vision and principles.

SONI / NIE Networks Future Operating Model

- Vision and Principles HLD agreed early in 2023.
- Applying the principles to the ongoing NI FLEX trial.
- Delivery approach for Future Operating Model is under consideration by SONI and NIE Networks.

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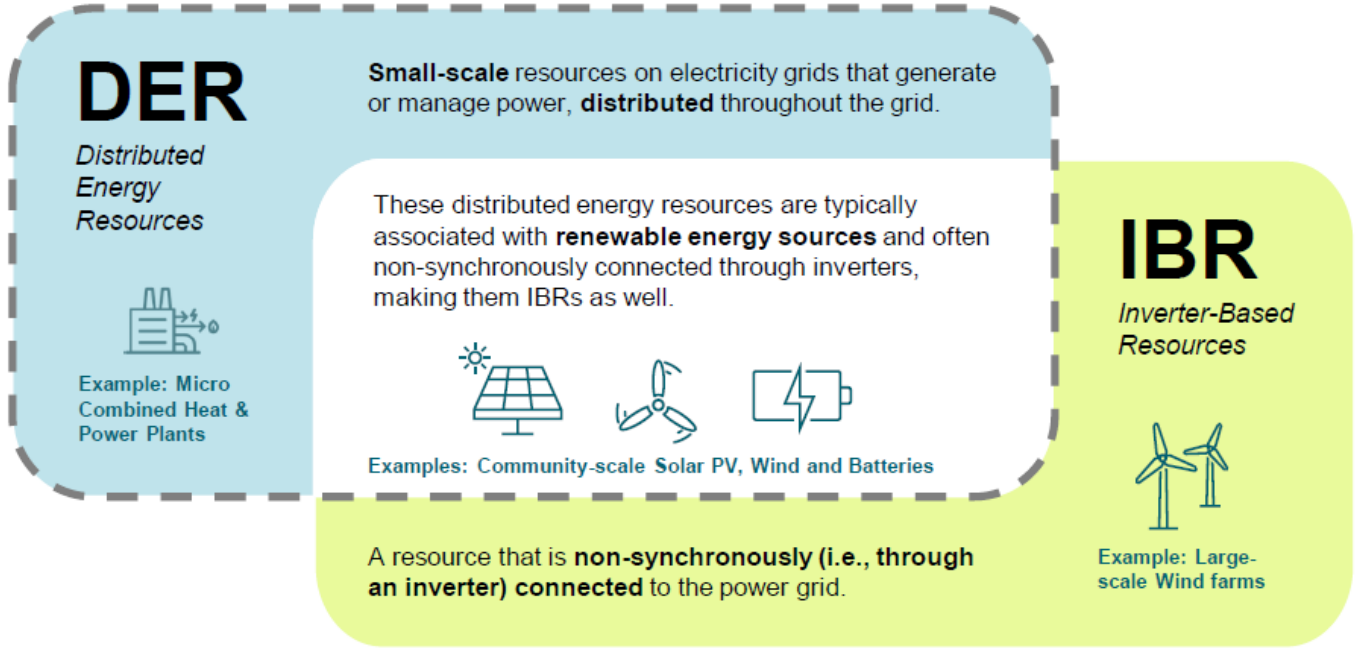
Understanding Distributed Energy Resources (DER) Performance

In Q4 2023, EirGrid and SONI initiated a system-wide piece of work, in coordination with ESB Networks and NIE Networks, on an assessment of Distributed Energy Resources (DER) standards.

This work has culminated in a final report covering:

- The current status of the all-island network and DER performance requirements
- Case Studies and learnings from same
- Research and Standards Review
- Recommendations and Next Steps



This report is currently being reviewed, and considerations are ongoing regarding next steps.

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Electromagnetic Transient (EMT) Modelling Roadmap

Roadmap development process ran from Sept 2023 to February 2024 and included engagement with 11 TSOs and 1 OEM

Goal of the project: Development of a roadmap for the implementation of an EMT study capability within the EirGrid Group in view of **stability issues associated with inverter-based resources (IBR) and inverter-based loads (IBLs)** under either high prevalence or **weak network conditions**.

Near term tasks (0 – 1 years)

1. EMT tool selection
2. Collect plant models
3. Review existing policies and grid code modelling requirements and specification

EirGrid will start requesting EMT models from new connections. Requirement already specified in Grid Code PC. A8 clause.

Medium term tasks (1 – 4 years)

1. Resource building
2. Form Data Management Team
3. Develop EMT system model
4. Develop EMT study tools, policy and Handbook
5. Form Dynamic Analysis Team
6. Deploy IT infrastructure
7. Training Provisions
8. Real Time EMT Strategy

Longer term tasks (4 – 10 years)

1. Determine online EMT strategy
2. Deploy online IT infrastructure
3. Develop online EMT tools and models

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System Strength

Goal of the project: Ensure that system strength is considered in operating and planning processes, thereby ensuring a secure and reliable electricity system.

Timeline: Project kicked off in April. Expected completion of this phase of the work c. End July.

Stakeholder engagement: A workshop will be held during the summer to share the latest thinking and get stakeholder feedback.

- Assess how other transmission system operators define system strength
- Assess which metrics EirGrid and SONI could use to define and measure system strength in Ireland and Northern Ireland
- Define how EirGrid and SONI should assess, forecast and monitor the proposed system strength metrics
- Identify the tools/data/modelling required for EirGrid and SONI to assess/monitor/forecast the proposed metrics

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Hybrids

Over-Install - Ireland

EirGrid has completed its review of the outstanding items highlighted in CRU's Installed Capacity Cap decision paper. Go live dates for over-install will be published shortly.

Over-Install – N. Ireland

SONI is finalising remaining requirements to facilitate the removal of the over-install limit in Northern Ireland for transmission level. Go live date is expected to be released this quarter.

Sharing of MEC – All Island

EirGrid and SONI have completed a review internally examining the challenges for implementation, identifying possible solutions to these challenges and estimating resources required to implement. Commencing the next phase (detailed design and implementation) is dependent on regulatory decisions.

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Other Updates

Grid Code Modifications

Draft Grid Code Modifications to incorporate Synchronous Condensers were shared with JGCRP members for comment, after which the normal Grid Code process will be followed in each jurisdiction.

Phase 2 of ESPS Grid Code Modifications were brought to the JGCRP on 20th March. Some panel members requested more time to review and have sent us comments.

Demand Side White Paper

EirGrid will shortly publish a TSO Demand Side White Paper.

This White Paper is the first stage of work on a TSO demand side strategy.

Low Carbon Inertia Services

Contract Award Notice published for Phase 1 Low Carbon Inertia Services in Northern Ireland

Procurement process still ongoing in Ireland

Qualification Trial Process (QTP)

No tenders were received to the procurement process for the DS3 System Services QTP, which closed on 26 January.

Next steps, and lessons learned for future processes, to be discussed with CRU and UR.

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