



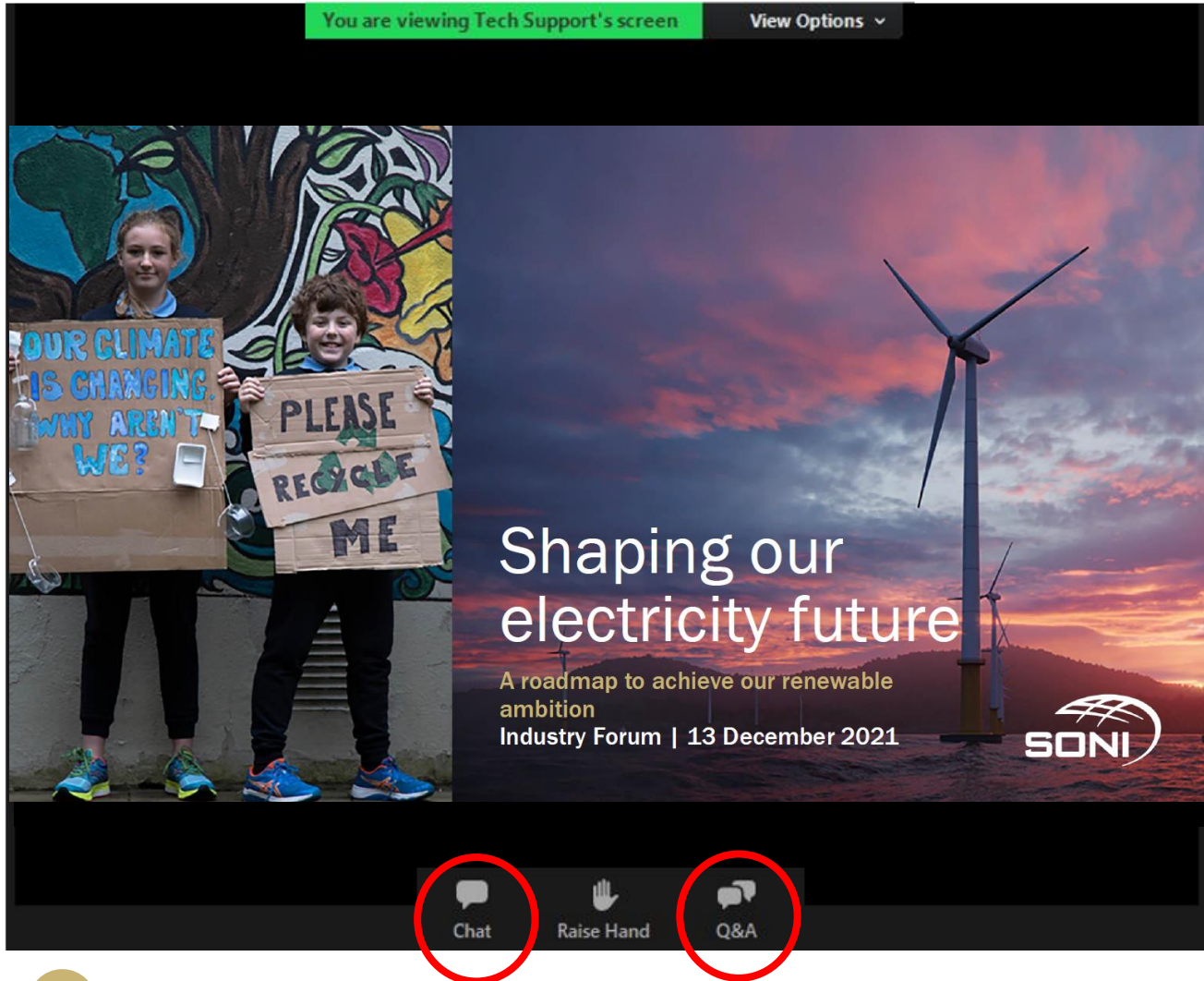
Shaping our electricity future

A roadmap to achieve our renewable ambition

Industry Forum | 13 December 2021

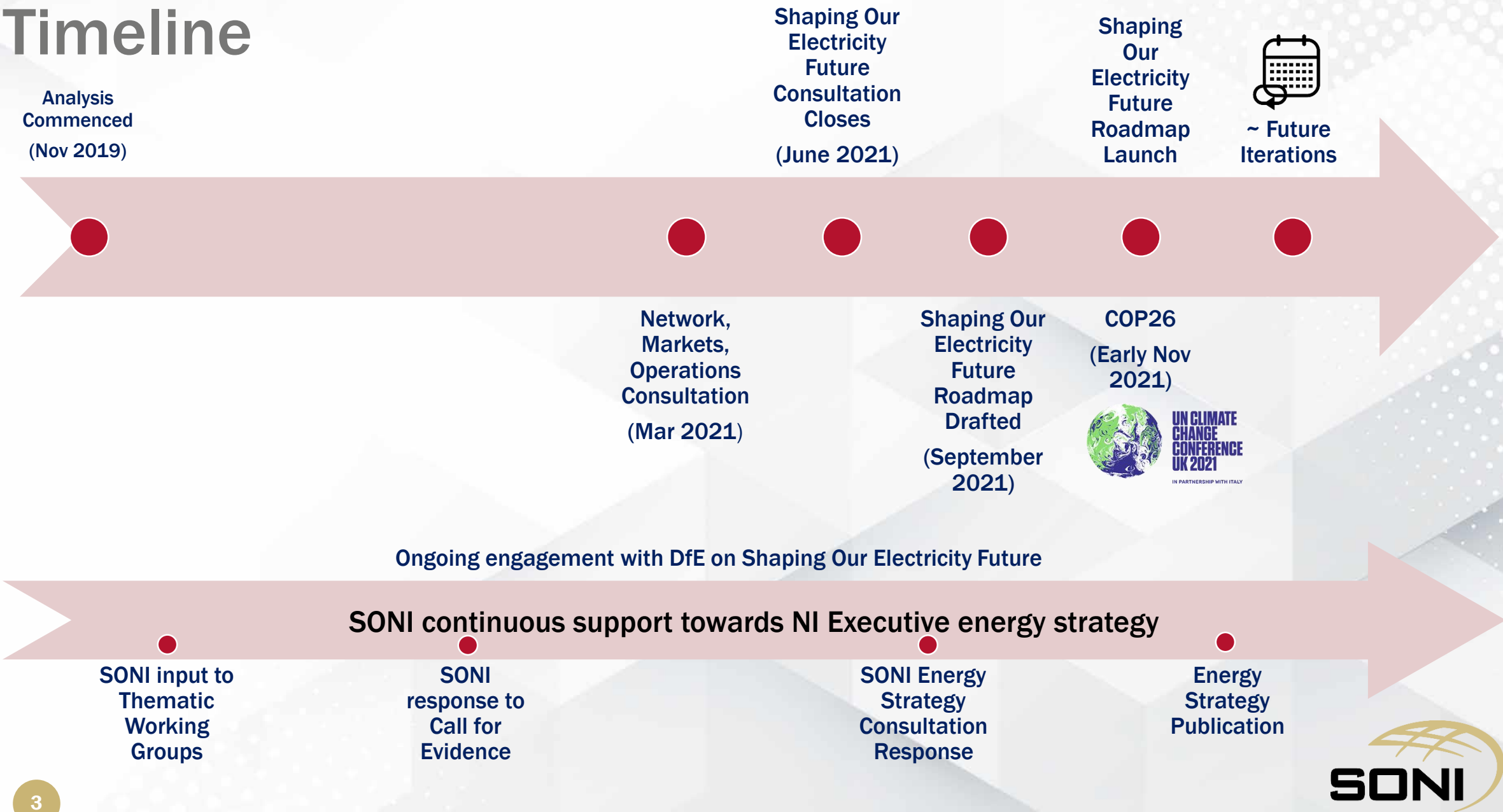


What's on your screen?



- Use the Q&A function for questions as we go through.
- Use the chat function to speak to other attendees.
- The webinar will be recorded and accessible later this week.

Timeline





Finding a balanced solution

- **Shaping Our Electricity Future Roadmap – is the blueprint for Northern Ireland’s clean electricity future.**
- **It is the result of :**
 - **A comprehensive 14-week consultation across almost all sectors of society**
 - **2 years of research by the experts at SONI, including tens of millions of technical simulations.**
- **By implementing this roadmap SONI will seek to deliver at least 70% by 2030 while maintaining a secure supply of electricity and minimising the cost to the electricity consumer.**



Agenda

09:00 Welcome and Introduction

09:15 Engagement/ Q&A

09:45 Networks / Q&A

10:15 Break

10:30 Markets / Q&A

11:00 Operations / Q&A

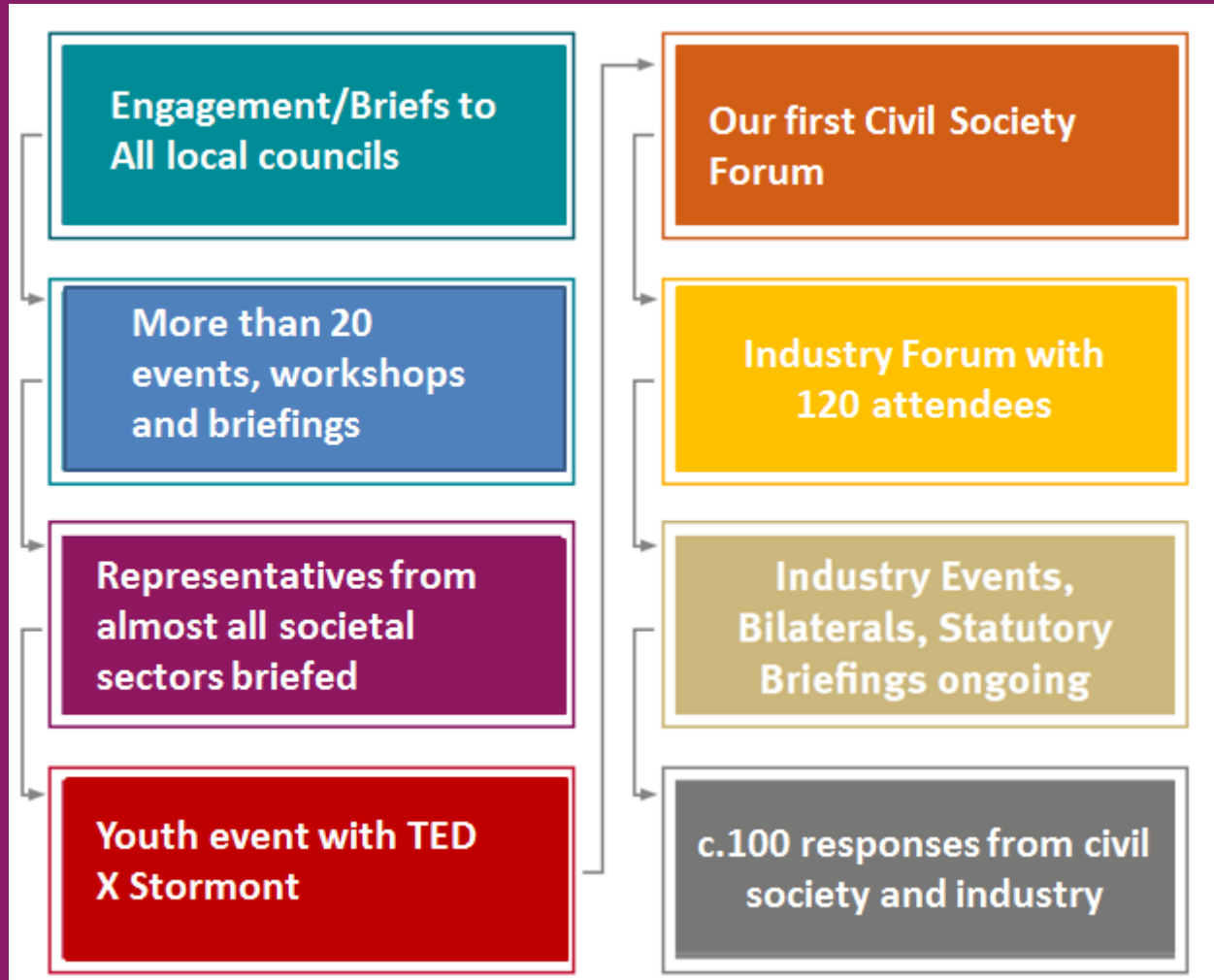
11:30 Concluding Comments

11:45 Close



Engagement

SOEF Consultation and Engagement



14-week
Consultation and
Engagement Programme

Cost-Effective 360
Communications Campaign
Supported and Amplified our Public
Engagement

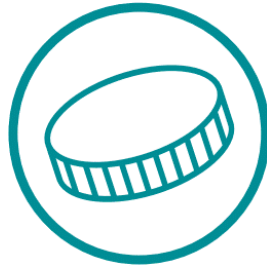
Public Consultation Feedback



**Benefits for
regional and rural
communities**



**Community
ownership**



**Keeping costs
manageable**



Microgeneration



**Social
acceptance**

Onshore-generation

Ecology

Security-of-supply

Public-engagement

New-technology

Landowner-concerns

Role-of-SONI

Environment

Offshore-wind

Future-proofing

SONI unveil roadmap to radically transform the NI electricity grid

'Shaping Our Electricity Future Roadmap' is foundation for Stormont's 2030 renewable electricity target

To date, hard evidence that we are on course for 'net zero' emissions by 2050 is not readily available. Most implementation plans are still in tentative form.

The recent preparatory work by SONI (the electricity systems operator for NI) is a welcome exception. SONI has published technical and policy papers with the theme, Shaping our Electricity Future.

John Simpson

SONI unveils roadmap to transform power grid



Jamie Delargy @enirgy_info · Nov 9

Following a 14 week long consultation, electricity transmission system operator @soni_ltd has unveiled its Shaping Our Electricity Future Roadmap which is designed to be the foundation for delivering Stormont's apparent target of at least 70% renewable electricity by 2030

“

At the outset of this project, we made the commitment to minimise the need for new grid infrastructure while also transforming the transmission grid to help deliver Northern Ireland's renewable energy ambitions. ”

Alan Campbell
Managing Director, SONI



Engagement Next Steps

Policy	Industry	Regional	Civil Society	Landowners	Communications
<ul style="list-style-type: none"> • Continued briefings with DfE and UR in relation to roadmap roll out and evolution • Briefings with Key Ministers and New/existing Permanent Secretaries/HOCS 	<ul style="list-style-type: none"> • SGI briefing 8th Dec • SONI industry forum 13th Dec • NI Chamber & SONI SOEF event 18th Jan 2021 • Dedicated industry SOEF webinars (every 4 months) and fora (every 6 months) • Establish Shaping Our Electricity Future Advisory Council. 	<ul style="list-style-type: none"> • Biennial Cycle of Council engagement to support individual projects and SOEF roll out • Annual SONI Council Planning Officials Workshop • Continued engagement with NILGA and SOLACE • Establish NW presence (subject to funding) • Continued collaborative working with NIE Networks on grid project engagement and communication 	<ul style="list-style-type: none"> • SONI Civil Society Forum SOEF 15th December • Embed SONI's Enhanced 3 Part Process for Developing the Grid • Establish Community Fora pilot on forthcoming Mid Antrim Upgrade/ NW Reinforcement (subject to funding) • Publish our public engagement commitments 	<ul style="list-style-type: none"> • Ongoing engagement with UFU and NIAPA • Landowner workshop series on energy/ climate transition • Develop and implement a landowner engagement strategy as an extension of our Enhanced 3 Part Process for Developing the Grid • Appoint a Senior Landowner Engagement Officer 	<ul style="list-style-type: none"> • SOEF Roadmap to support Energy Strategy • SONI Knowledge Hub • Cost effective Regional Media campaigns in support of projects in 'part 2' of our engagement process • Revised SONI Website



Thank You
Questions?





Networks

Consultation - Networks

Four draft approaches to reach 70% by 2030

1

Generation-led

Put clean electricity generation
close to where most power is used

3

Technology-led

Try new ways to move clean
electricity across Northern Ireland

2

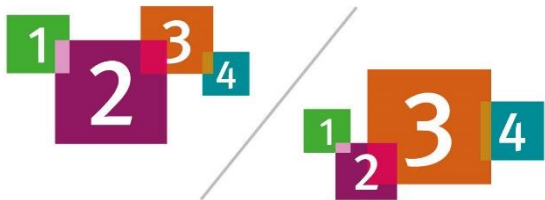
Developer-led

Let developers decide where to
locate clean electricity generation

4

Demand-led

Put large electricity users close to
sources of clean electricity generation

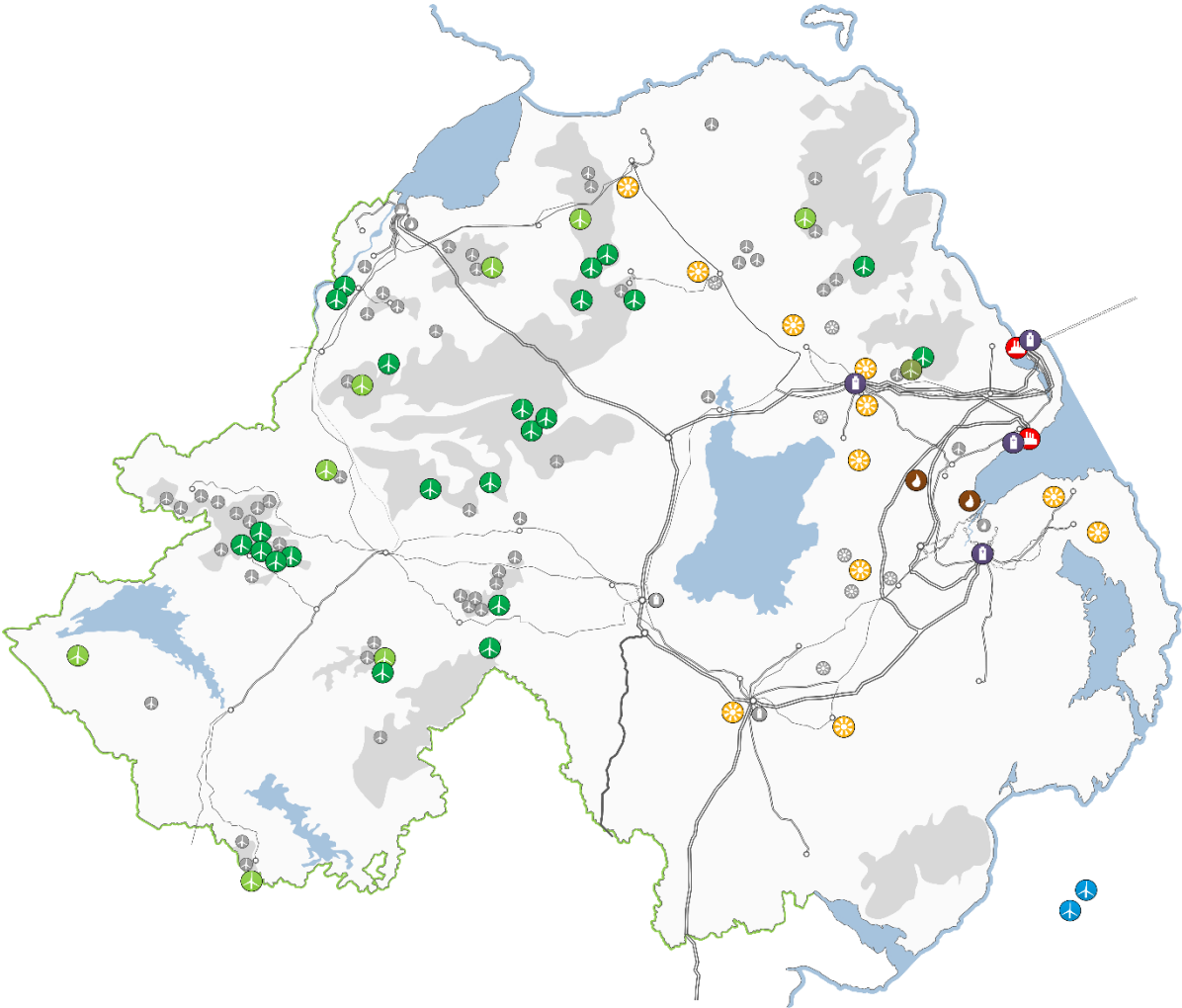


Our final plan will include elements of all
approaches, strongly led by one of them.











Consultation feedback shaping the final approach

- Public in Northern Ireland were supportive of a generation-led approach. Support also for demand-led and technology-led approaches.
- Public was keen to be more involved in the energy transition through the use of micro generation.
- Industry more positive about developer-led approach, there was concern over the ability to deliver offshore generation by 2030.
- Support across public and industry for a blended approach.

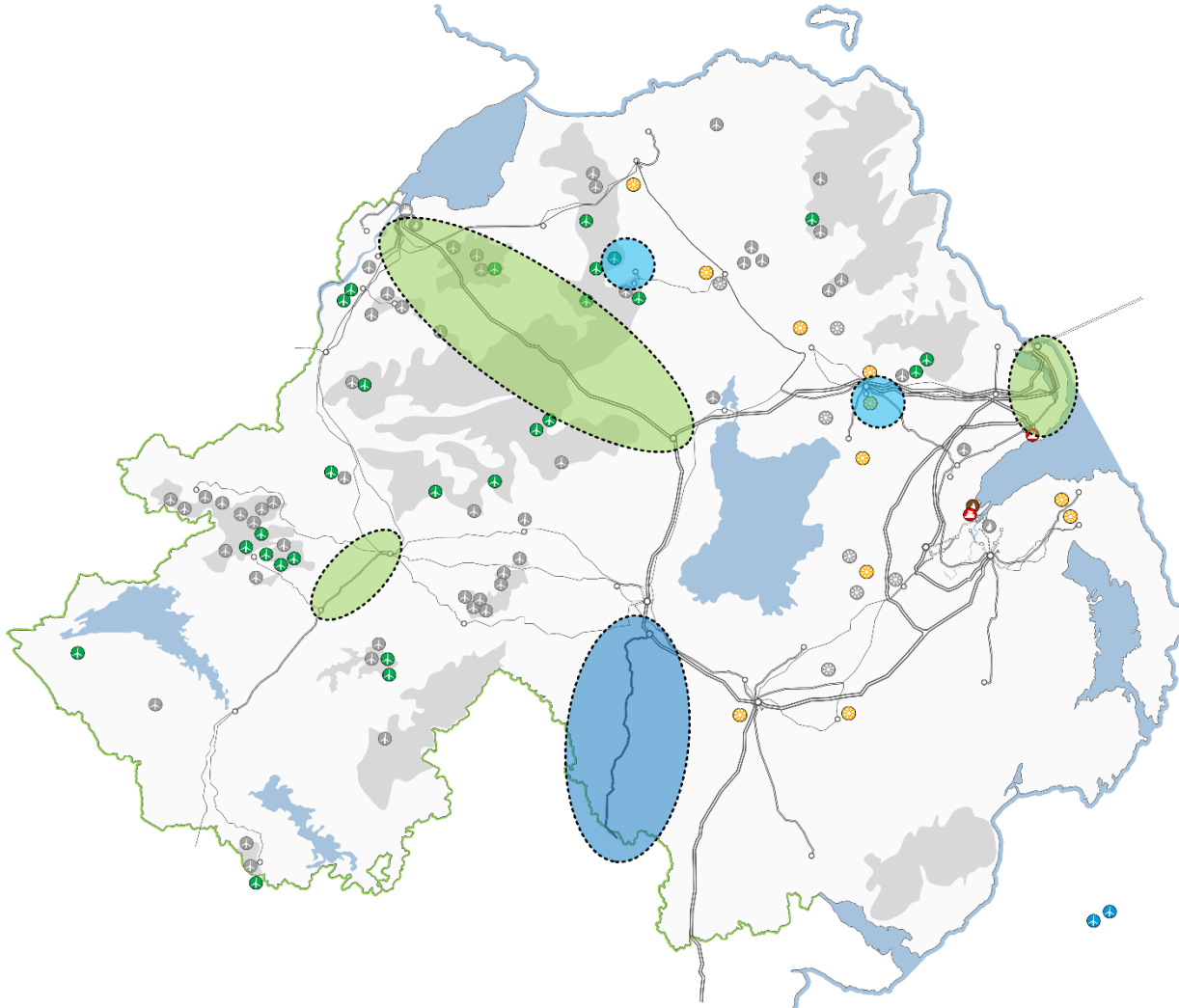
Final network approach



	Northern Ireland
New offshore wind	100 MW
New onshore wind	1100 MW
New PV- large	300 MW
New PV- micro	100 MW
New batteries	200 MW
New gas generation	600 MW

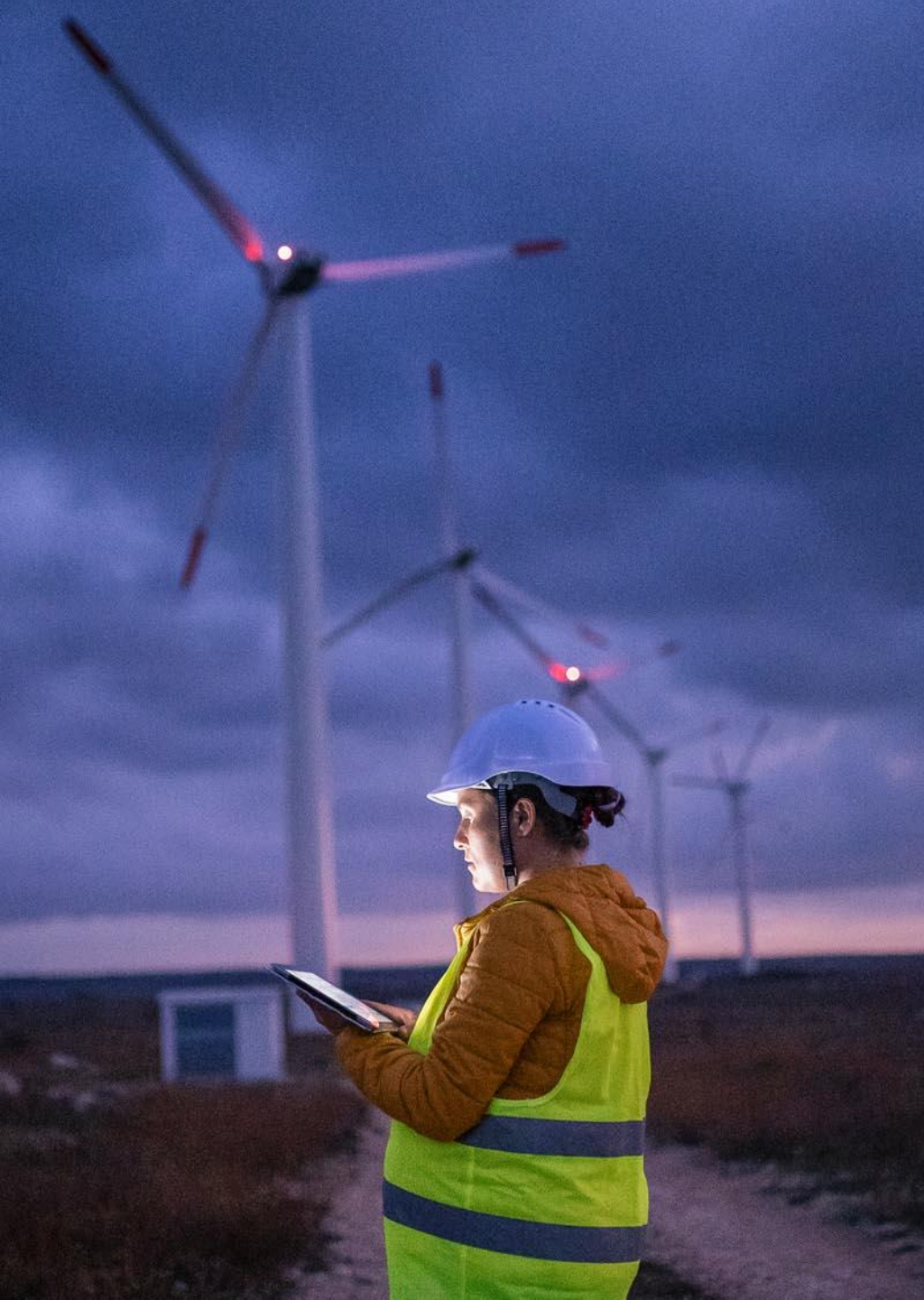
	Onshore wind: existing	1238 MW
	Onshore wind: replanted	204 MW
	Onshore wind: new	1012 MW
	Offshore wind	100 MW
	PV: existing	231 MW
	PV: new	386 MW
	Biomass/waste: new	40 MW
	Battery storage: existing	100 MW
	Battery storage: new	200 MW
	Thermal: new	600 MW

Base case reinforcements



Projects included beyond part 1 of NI grid development framework

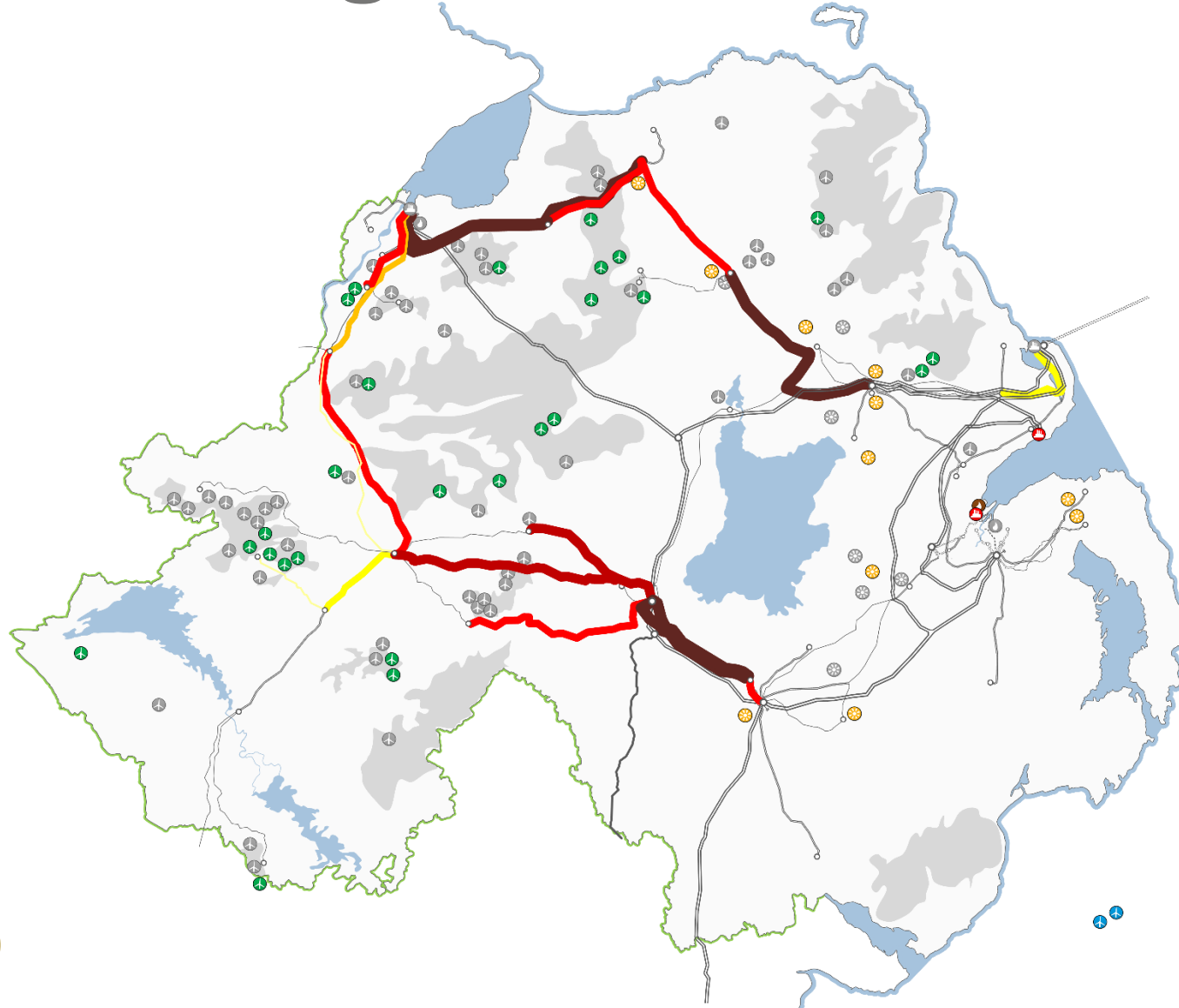
- One new circuit – North South interconnector
- Three circuit upgrades – Omagh-Dromore, Ballylumford-Eden and Coolkeeragh-Magherafelt.
- Two new generation clustering substations – Agivey and Kells.








Analysis

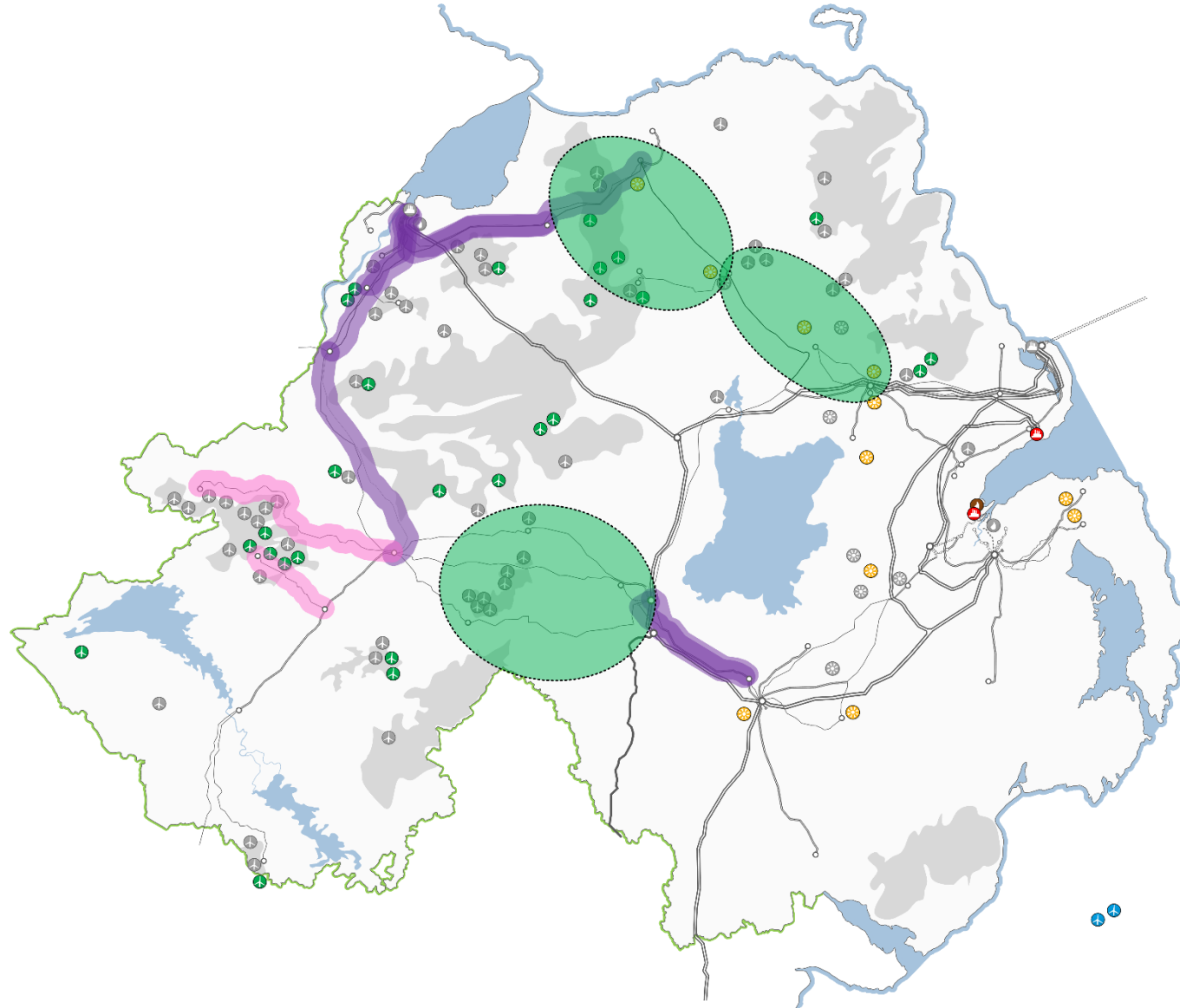
- Renewable generation modelled in line with final network approach.
- Demand modelled in line with high growth scenario from GCS.
- PLEXOS used to generation 8760 hours of dispatch.
- Dispatches assessed on network model in PSSE to determine impact on transmission network.

Remaining overloads



-  circuit loaded up to 105% thermal rating for up to 5% of the year
-  circuit loaded up to 110% thermal rating for up to 10% of the year
-  circuit loaded up to 120% thermal rating for up to 20% of the year
-  circuit loaded up to 130% thermal rating for up to 30% of the year
-  circuit loaded in excess of 130% thermal rating for over 30% of the year

Candidate reinforcements



New circuit (indicative area shown)



Uprate circuit



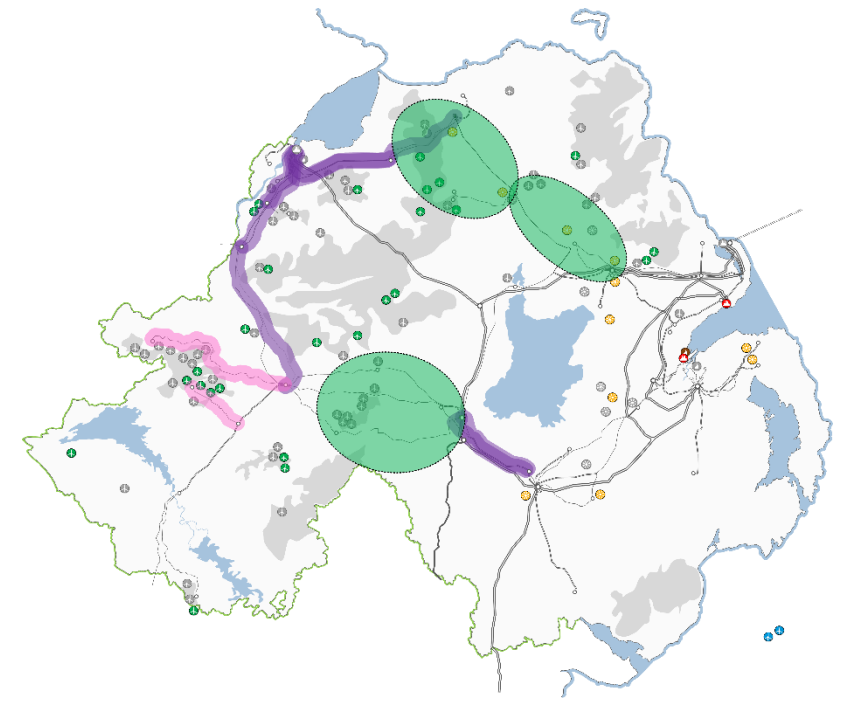
Dynamic Line Rating

12 Shaping Our Electricity Future Projects

3 new circuits

7 upgrades to existing circuits

2 new technology projects



SONI Grid Development Process

Part 1 and 2 involve extensive stakeholder and community engagement



Networks Multi-Year Plan

Project Name	Description	Parties	Start Date	Finish Date
End-End TSO/TO Approach to delivery	Work is underway to develop joint processes, and relevant amendments to subsidiary documents to support this. (i.e. Transmission Interface Arrangements). Moving into implementation.	UR, SONI, NIEN	Already commenced	Q1 2022
Technology Toolbox	Deliver electricity grid Technology Toolbox solutions for enhanced flexible network Operation	SONI, NIEN	Q4 2021	Q4 2026
Flexible Network Strategy	Develop flexible network strategy for deployment of “non-wires” electricity grid technologies	SONI, NIEN	Q4 2021	2024/25/26



Thank You
Questions?



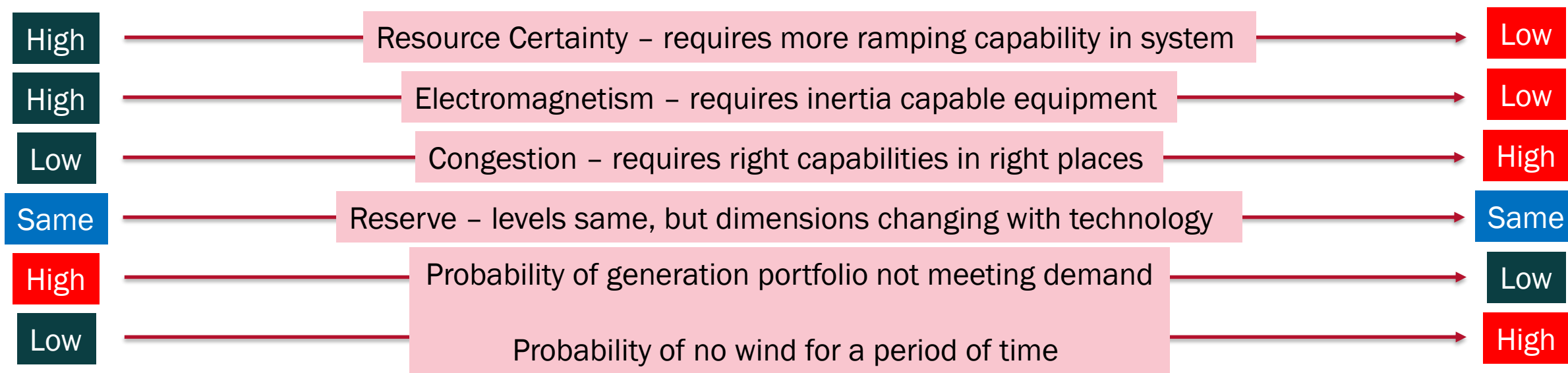


Markets

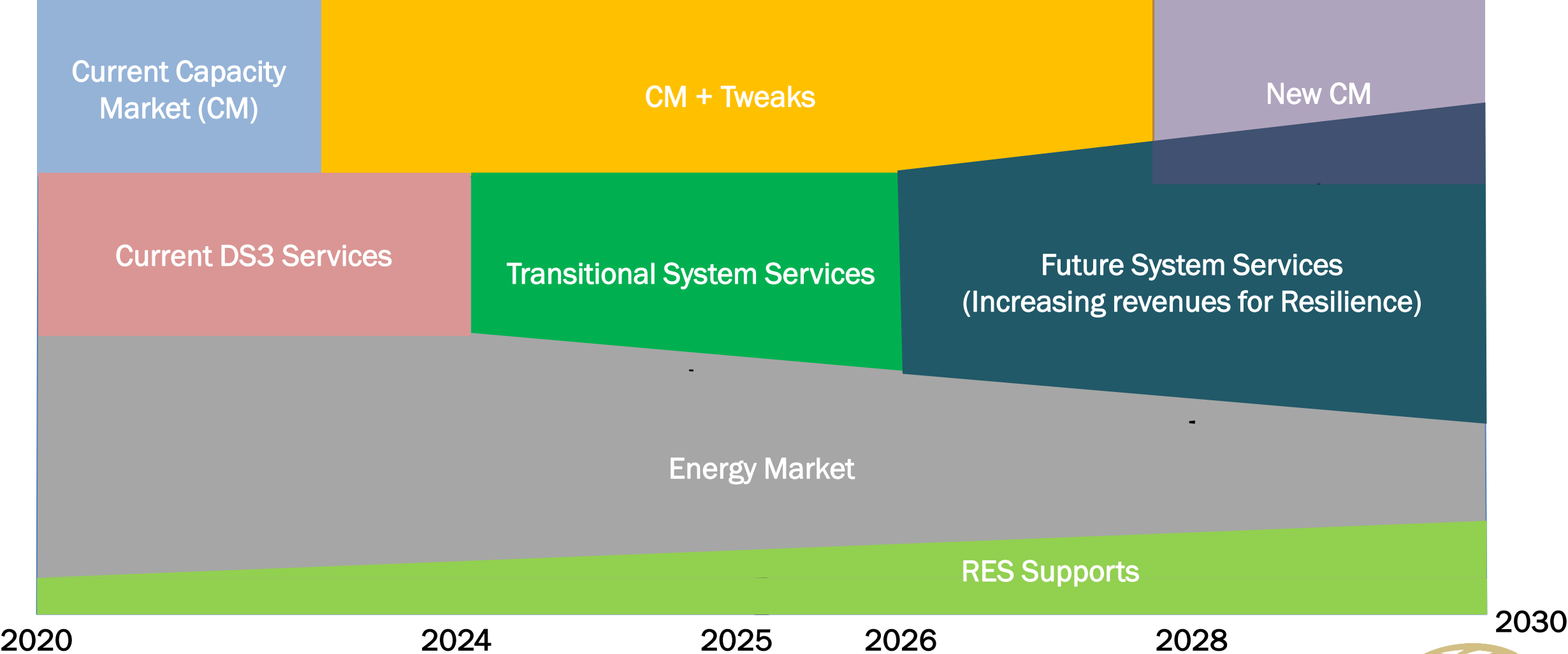
Overarching Vision

- In large scale investments the best outcomes are when those who are best able to manage the risk are responsible for managing the risk.
- There are 4 risks outside of the control of investors in electricity – oversupply, constraints, curtailment and TLAfs.
- If the markets do not explicitly deal with these risks the outcome is a false economy.

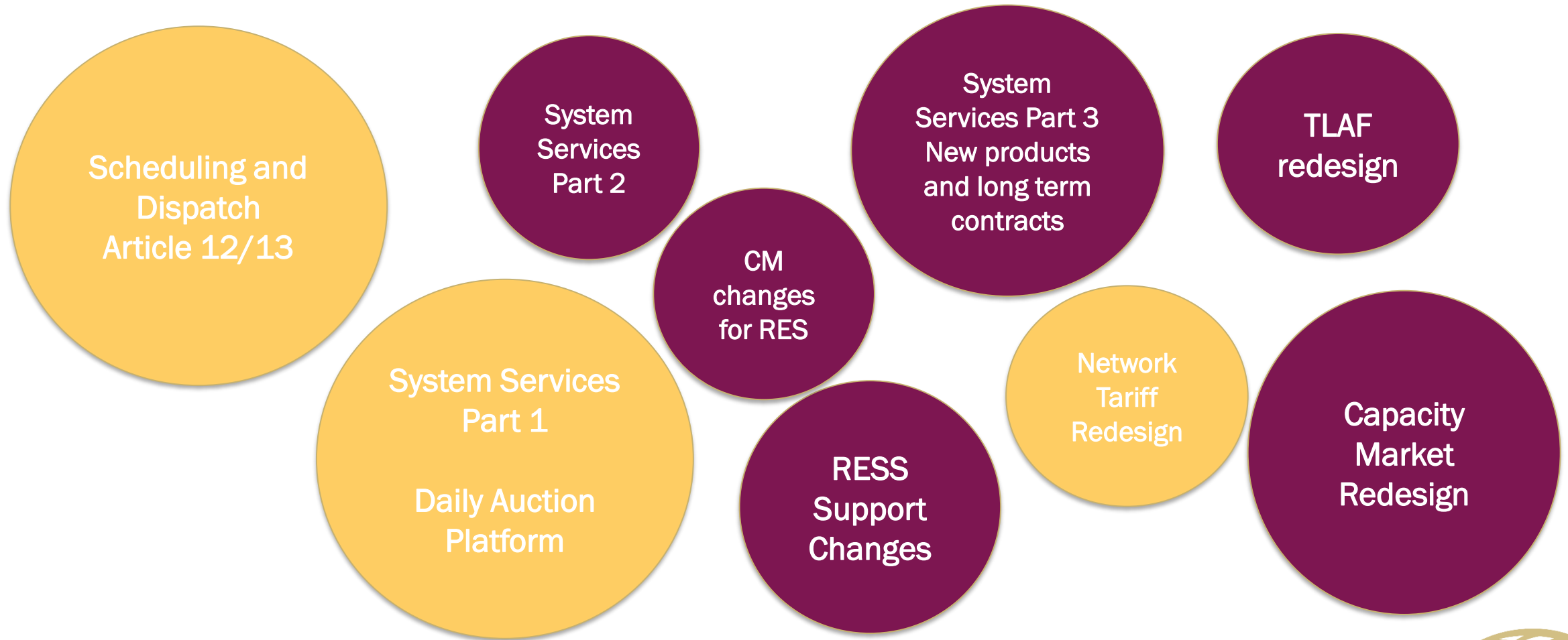
Challenges to the System over the Decade



Investment/market challenges over the decade



Aligning Markets to challenges of high RES

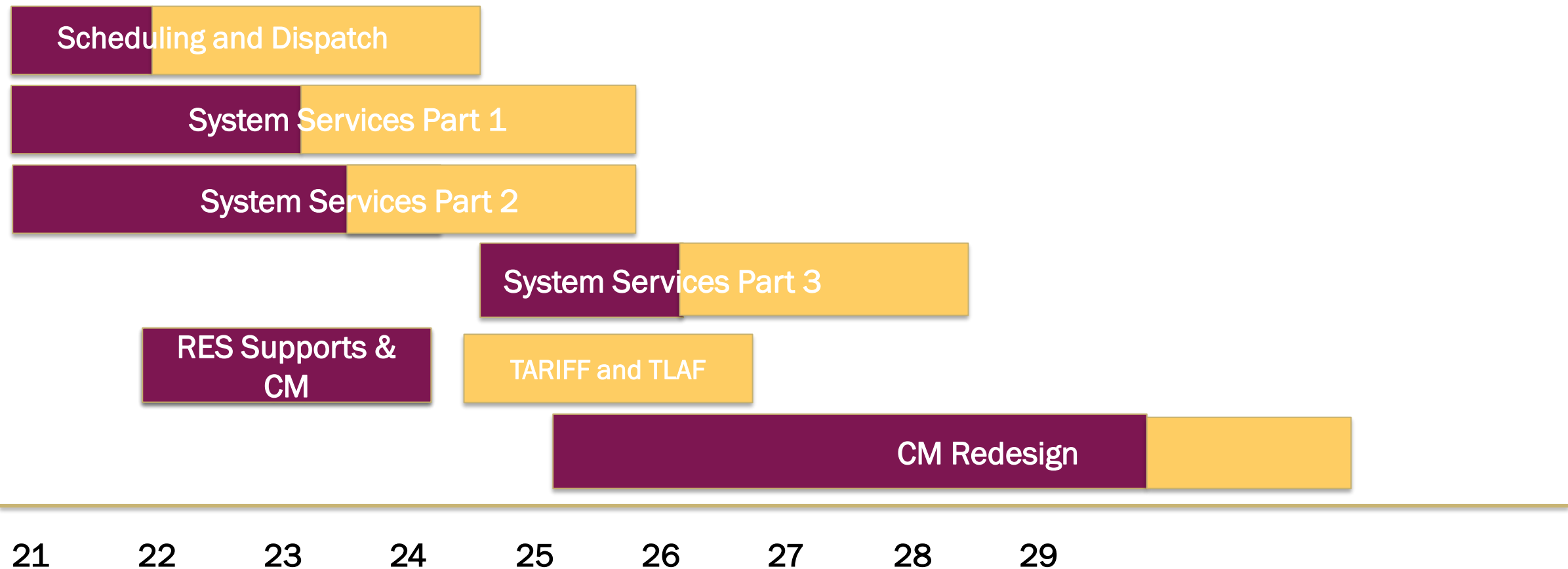


Contractual/Concept change

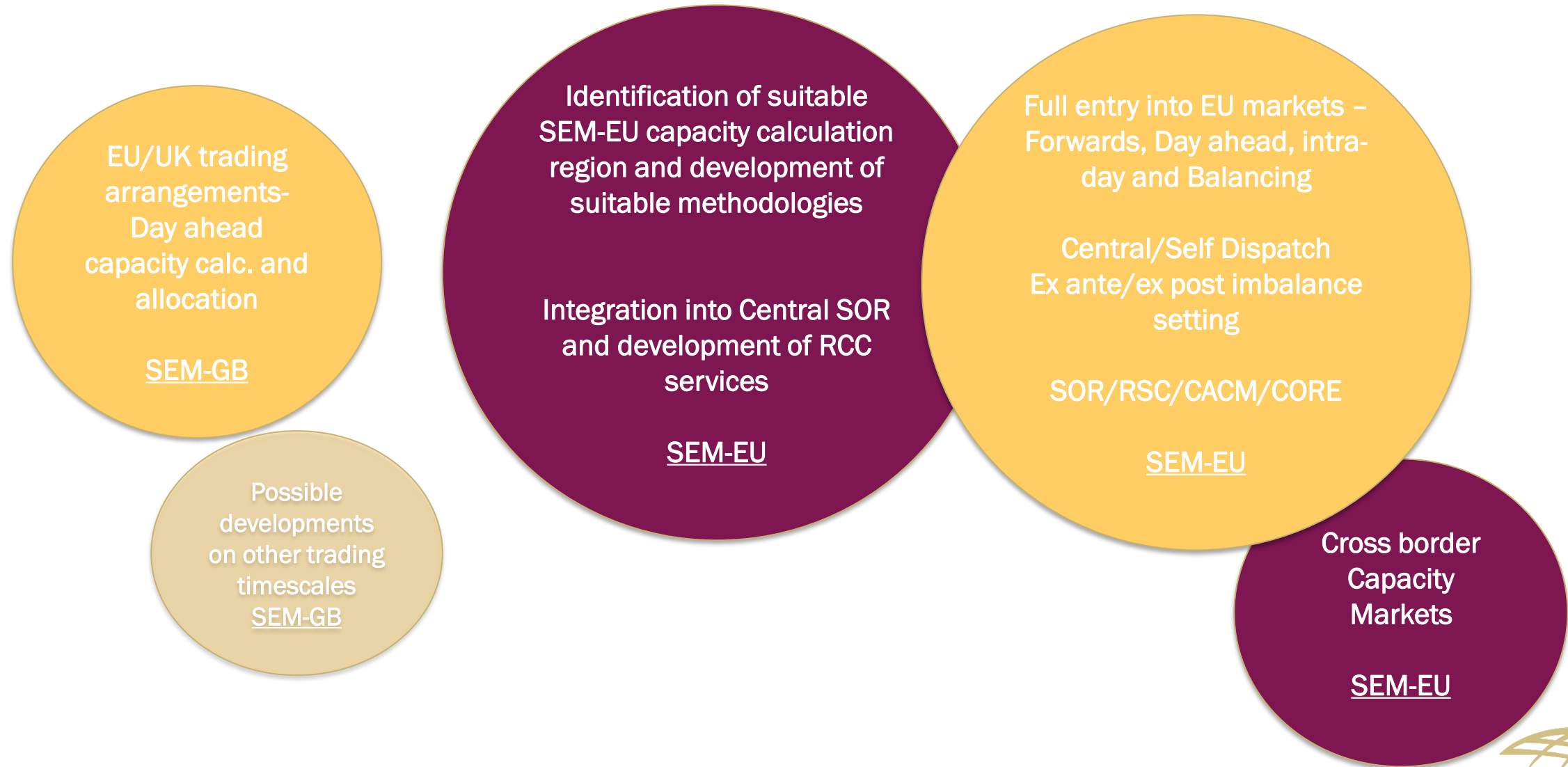


Conceptual and IT System change

SOEF Markets – Aligning - Pillar 1



Full Integration of the SEM to GB and EU Markets

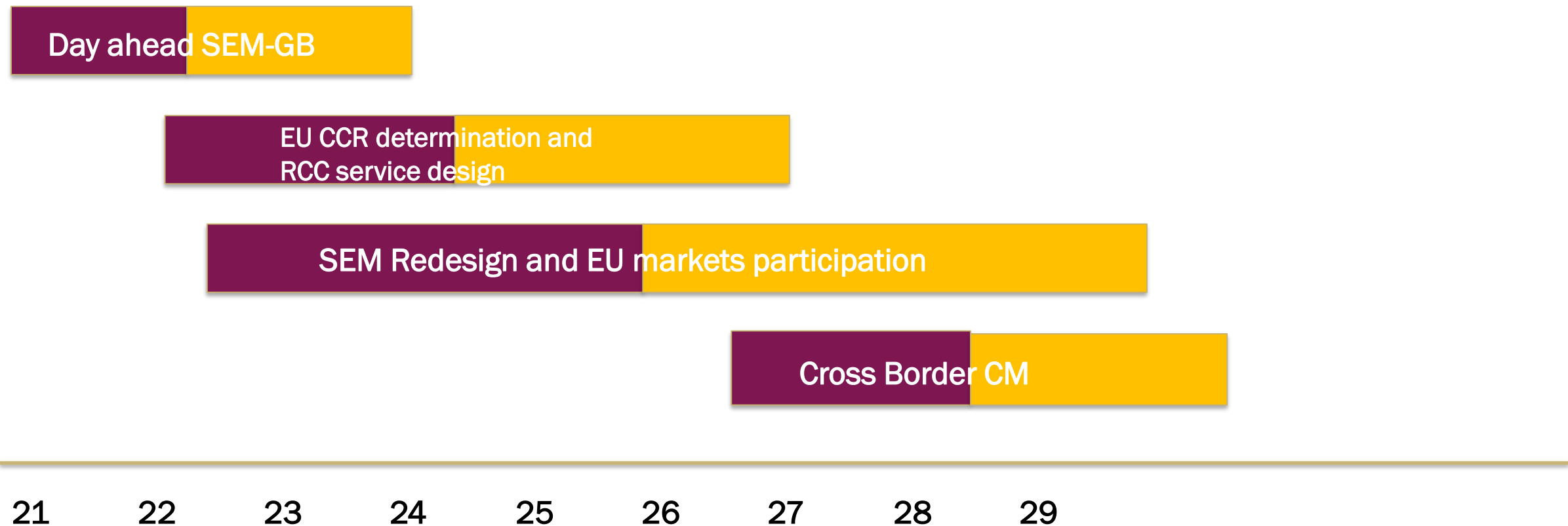


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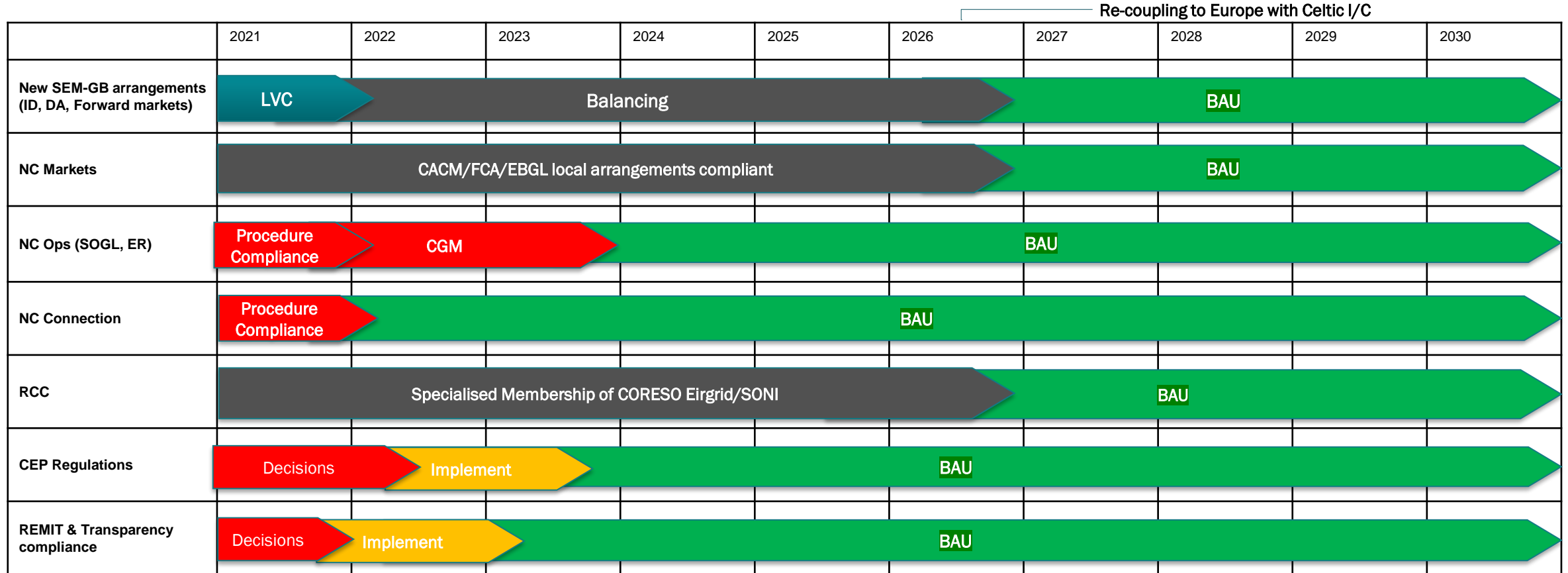


Conceptual and IT System change

SOEF Markets – Full Integration Pillar 2



Agree a plan to deliver for our partner...





Thank You
Questions?



Operations

System Operations – Multi-Year Plan



Operational Policy

Includes:

- Operational policy roadmap to 2030
- Studies & analysis
- Reduction in min gen
- SNSP 75%→85%→95%
- Probabilistic operations
- New interconnector operational protocols

Standards & Services

Includes:

- Procurement of low carbon inertia services
- Future Arrangements for System Services
- Grid Code evolution
- Enhanced performance monitoring

Operational Tools

Includes:

- Control Centre of the Future planning
- Enhanced scheduling & dispatch
- Integration of new grid technologies
- Interconnector integration
- European integration

Technology Enablement

Includes:

- Demand Side strategy
- Residential demand response trial
- Treatment of hybrid connections
- Code modifications
- Qualification Trial Process (QTP)
- I&R strategy

TSO-DSO Partnership

Operational Policy

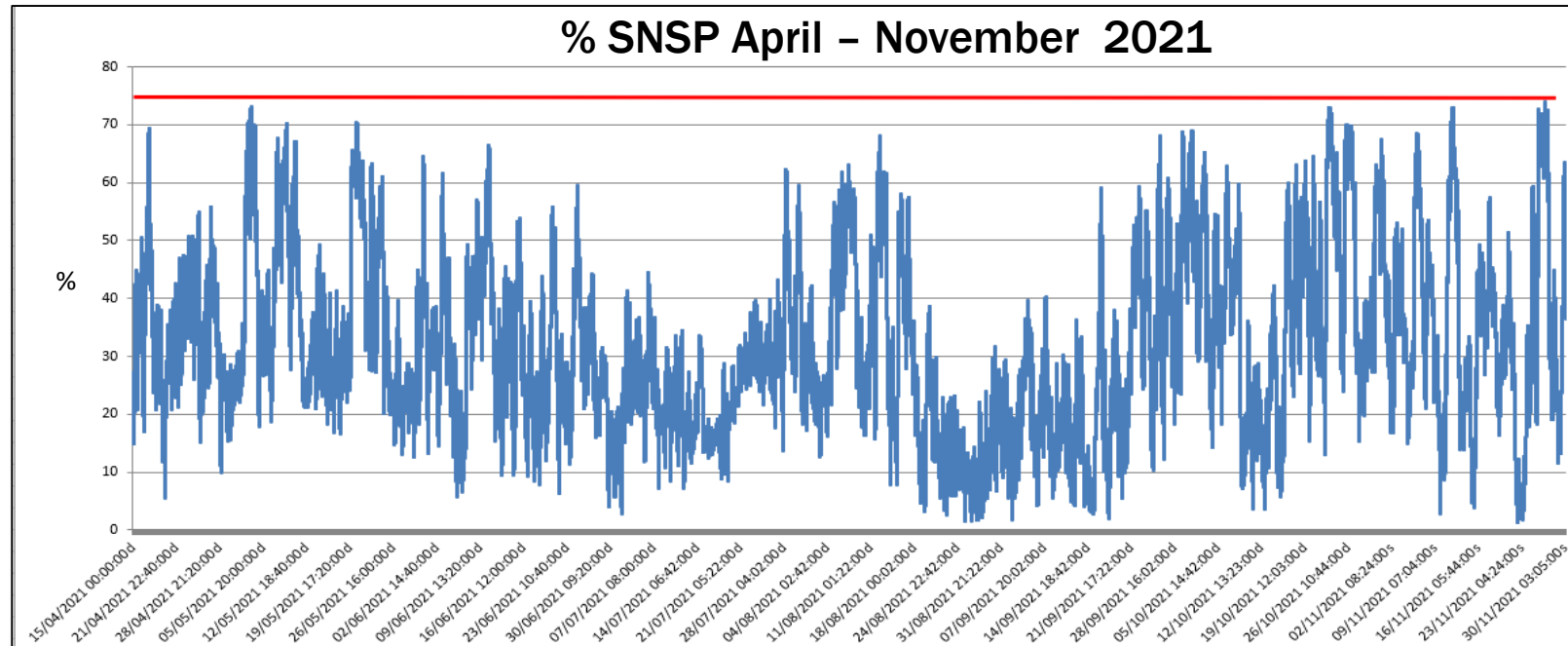
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$$\text{SNSP} = \frac{\text{Wind} + \text{Solar} + \text{Imports}}{\text{System Demand} + \text{Exports}}$$

	2021	2030 Target
Rate of Change of Frequency (RoCoF)	1.0 Hz/s*	1.0 Hz/s
System Non-Synchronous Penetration (SNSP) Limit	75 %*	95 %
Minimum Number of Large Thermal Generating Units	8	4 or less
System Inertia Floor	23,000 MWs	17,500 MWs



Standards & Services

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Includes:

- Procurement of low carbon inertia services
- Future Arrangements for System Services
- Grid Code evolution
- Enhanced performance monitoring



SONI GRID CODE

8th October 2020



Technology Enablement

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Includes:

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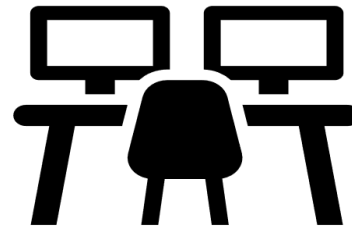
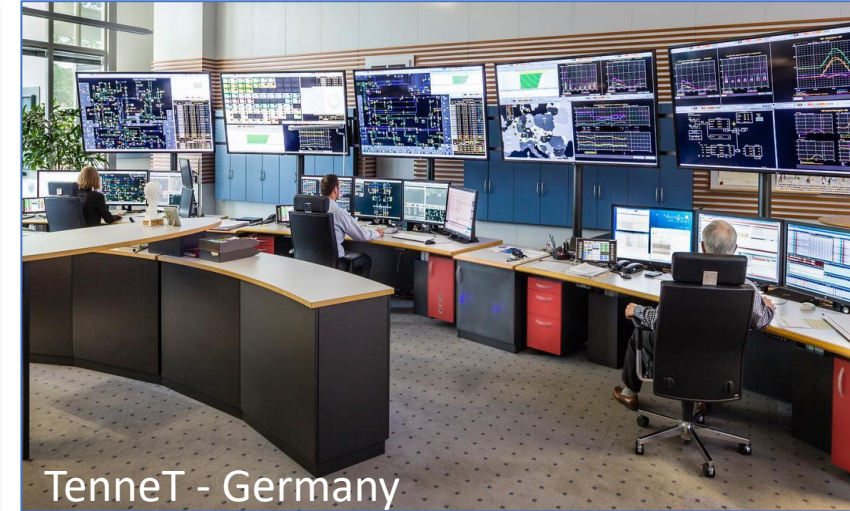
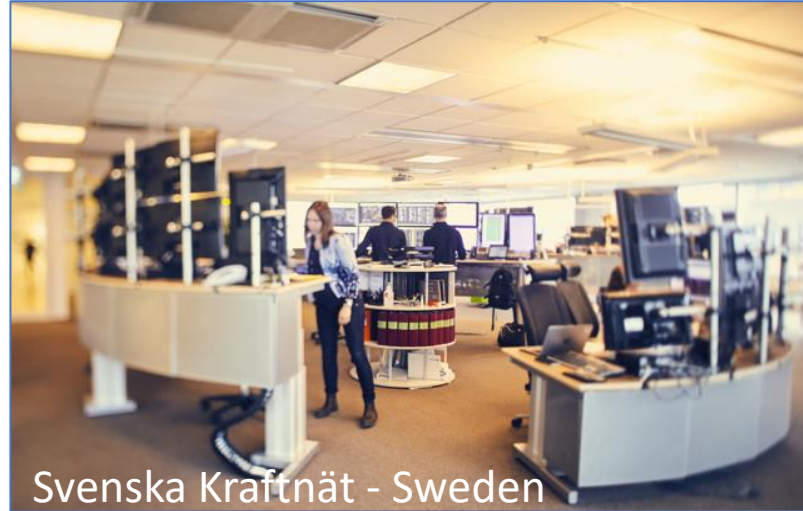


Operational Tools

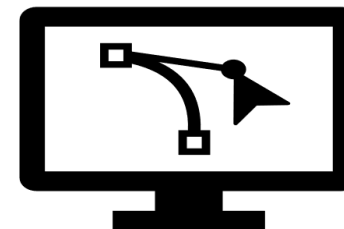
Operational Tools

Includes:

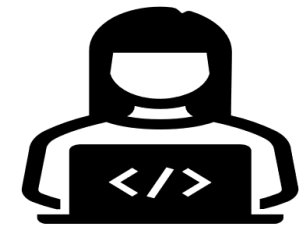
- Control Centre of the Future planning
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Effective Facilities

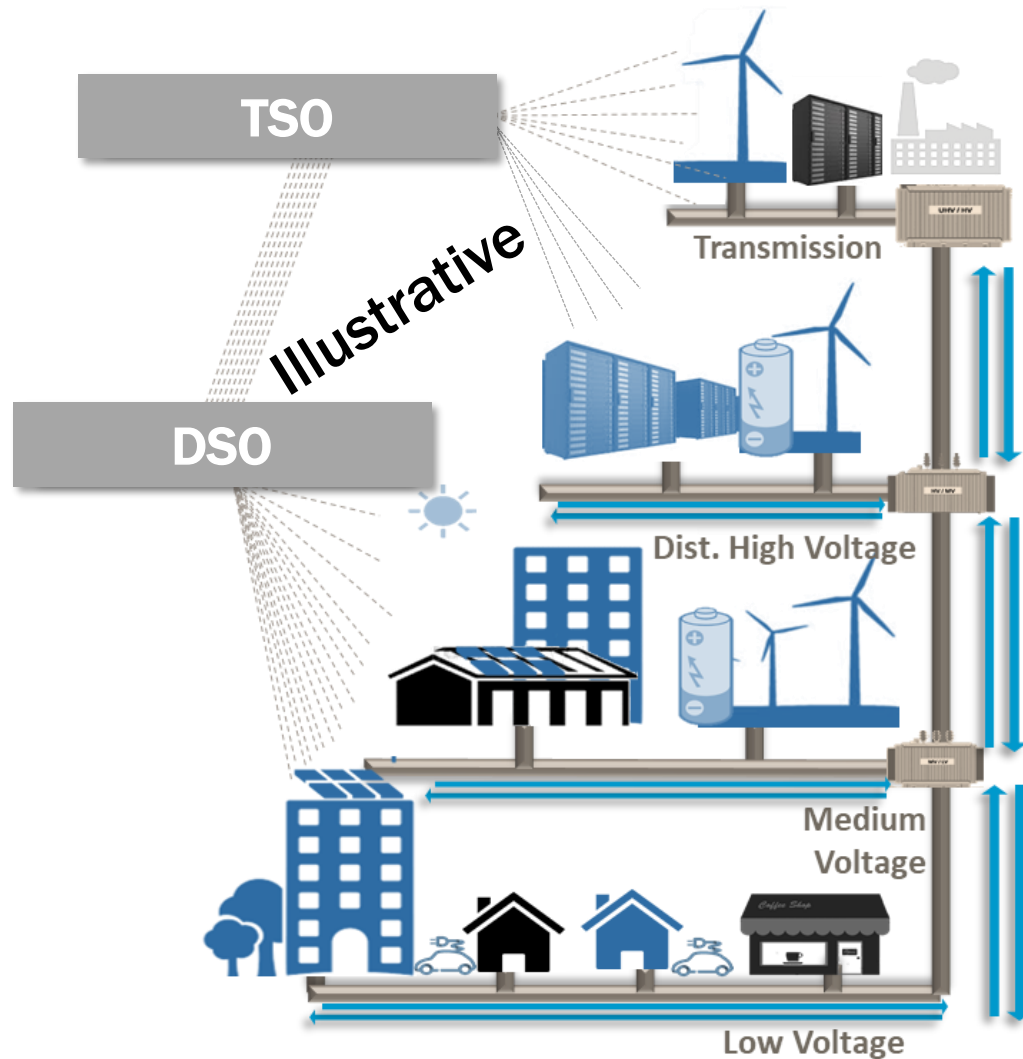


Effective Applications



Effective Operators

TSO-DSO Partnership



Operational Policy

Includes:

- Operational policy roadmap to 2030
- Studies & analysis
- Reduction in min gen
- SNSP 75%→85%→95%
- Probabilistic operations
- New interconnector operational protocols

Standards & Services

Includes:

- Procurement of low carbon inertia services
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Operational Tools

Includes:

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TSO-DSO Partnership





Thank You Questions?



Summary

Summary

- Shaping Our Electricity Future Roadmap was published in November 2021.
- It provides a robust and deliverable plan for 2030 and ultimately towards a net zero carbon energy system by 2050.
- To achieve renewable ambitions by 2030, significant network delivery will be required (existing projects, refurbishments, new projects).
- The operational pathways to 2030 will support safe and secure delivery of up to 95 % SNSP.
- Markets must incentivize the right investments, in generation adequacy, new technologies and system services, in a timely and affordable manner.
- Engagement with key stakeholders is vital to the delivery of the Shaping Our Electricity Future Roadmap

A close-up photograph of two hands, one from a darker-skinned person and one from a lighter-skinned person, reaching towards each other in a gesture of support or partnership. The hands are positioned in the center of the frame, with fingers slightly spread. The background is a soft-focus sky with light blue and white clouds. The text is overlaid in the center, in a clean, white, sans-serif font.

Thank you
We can't do this without you
and we *have* to do this

