Distributed ReStart

Webinar 8th January 2020

In partnership with

tnei

SP ENERGY NETWORKS

nationalgridESO

Agenda

- Review of last year & the year ahead

- Organisational systems & telecommunications update – Jo Carter
  - Delivery & forward view
  - Approach
  - Challenging environment
  - Stakeholder engagement
  - Organisational Impact
  - Operational Telecommunications – Existing & Potential
  - Conclusions & next steps

- Procurement & Compliance update – Sophie Corbett

- Q&A – Project Team

Review of last year & the year ahead……

- 2019 – Busy year with the delivery of our initial reports for each work stream

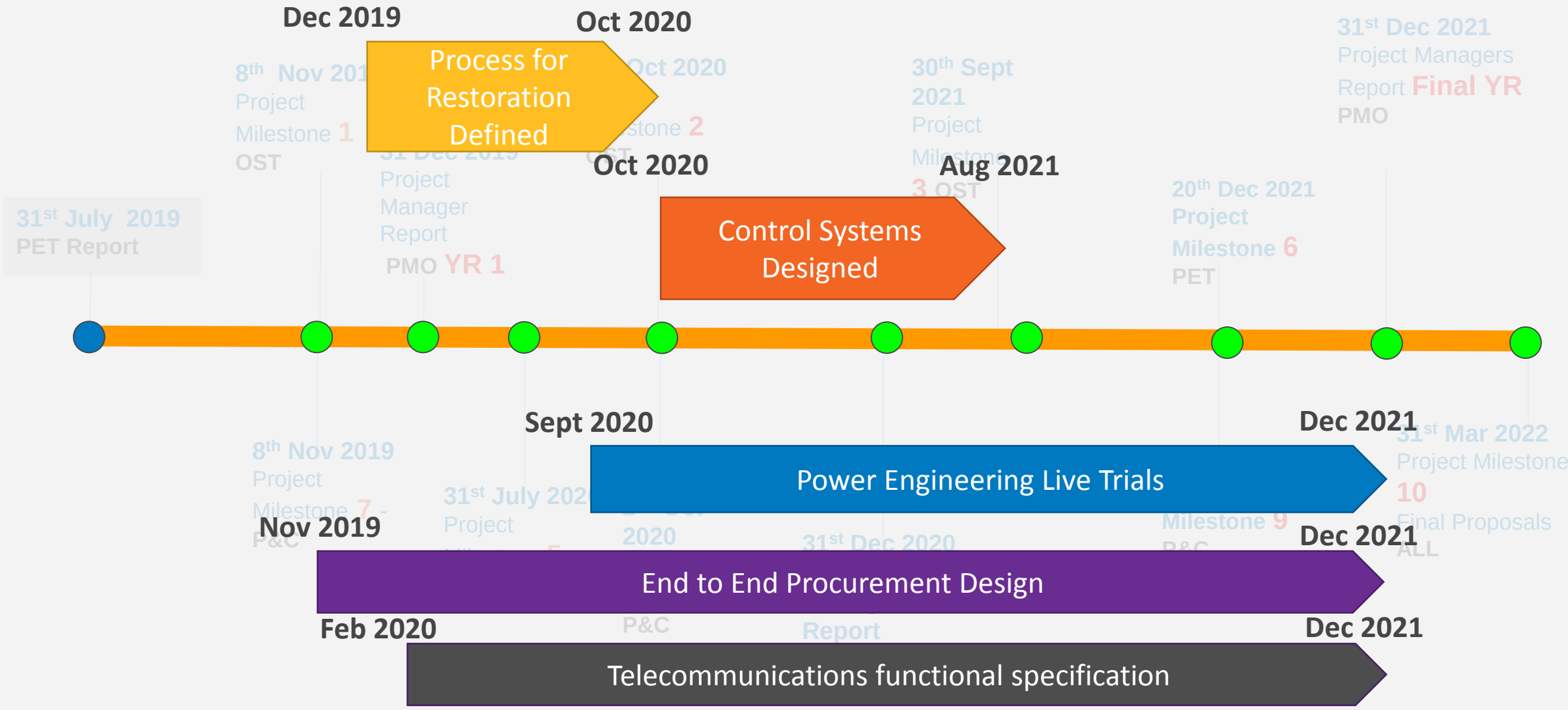
  All Project Deliverables were met for ‘Options Stage’

  Across the whole project decisions on cost incurred have been made with consideration of the best consumer value proposition in mind.

  Stakeholder Engagement has been a huge success

- 2020 – Will see theory begin to be put into practice

Project Timeline



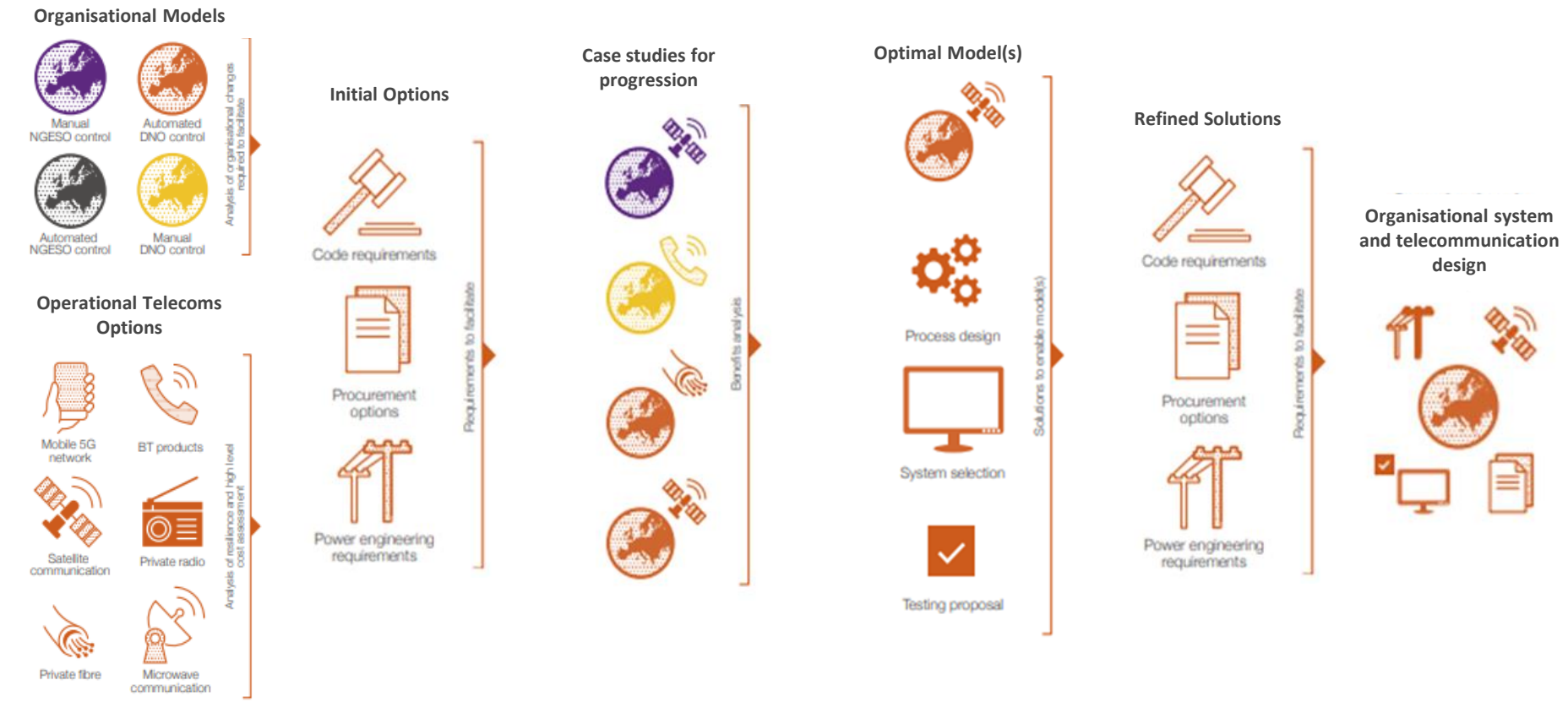
The year ahead……

WEBINAR	HOLDING	Organisational Systems & Telecommunications, Procurement & Compliance Overview	08/01/2020
PANEL	HOLDING	Stakeholder Advisory Panel	13/01/2020
FORUM	ATTENDING	Flexibility Forum - Cornwall Insights	15/01/2020
FORUM	ATTENDING	Green Generators Group - Cornwall Insights	16/01/2020
PAPER	SUBMITTING	CIGRE	20/01/2020
EVENT	HOSTING	Distributed ReStart Annual Conference	30/01/2020
WORKSHOP	HOLDING	Academia Forum	20/02/2020
EVENT	SPEAKING	Future Networks 2020	25/02/2020
EVENT	ATTENDING	Development in Power Systems Protection 2020	09/03/2020
PAPER	SUBMITTING	CIRED	16/03/2020
Event	EXHIBITING	Utility Week Live	19/05/2020 20/05/2020

Distributed
ReStart

Jo Carter
Organisational Systems & Telecommunications Lead

Delivery & Forward View



Delivered so far

Viability assessment

Delivery by October 2020

Design process, roles, requirements, systems and Operational Telecommunications

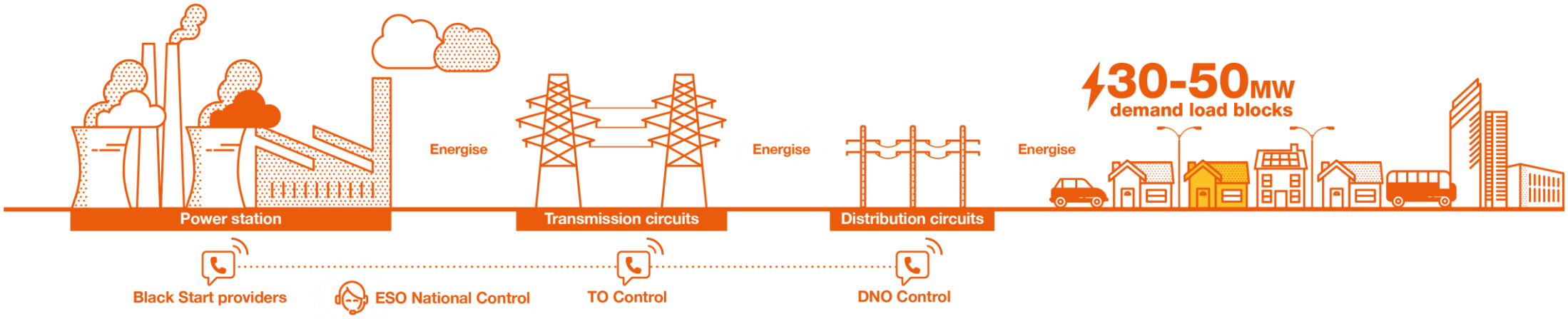
Delivery by project end

Test and refine

Approach

Our approach has been to consider:

- how the current Black Start process works
- the key requirements for a Black Start process
- the challenges of incorporating DER into the process
- what future-proofing is needed
- what options are available to fulfil these requirements



Challenging environment..

Changing Industries

- Energy and telecommunication industries are undergoing rapid change

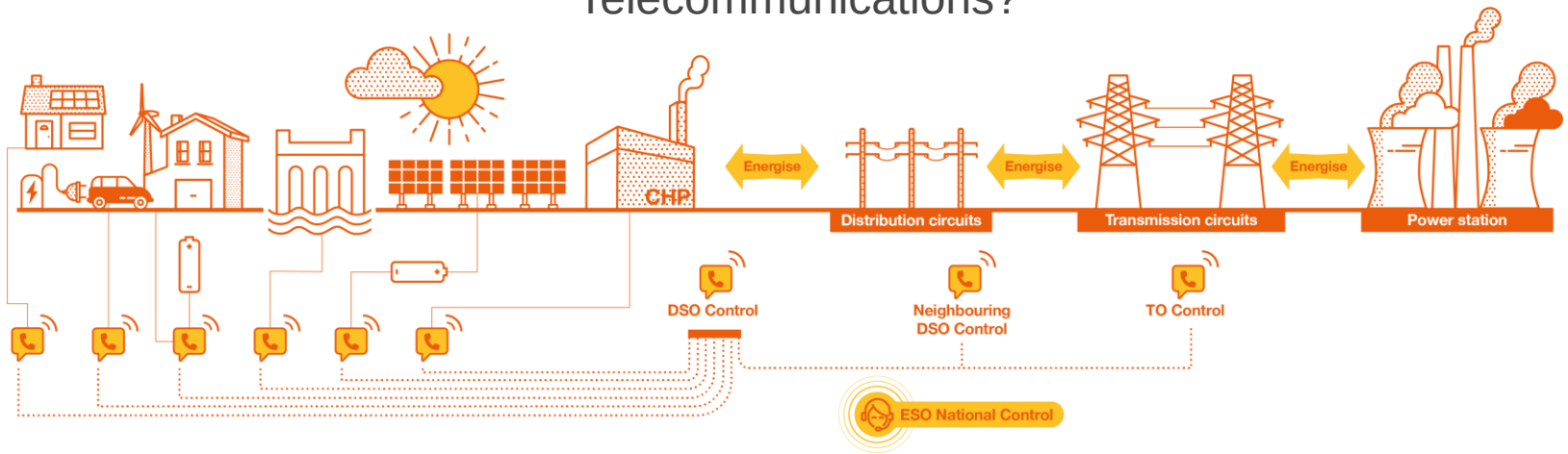
Black Start Stakeholders

Vast increase in:

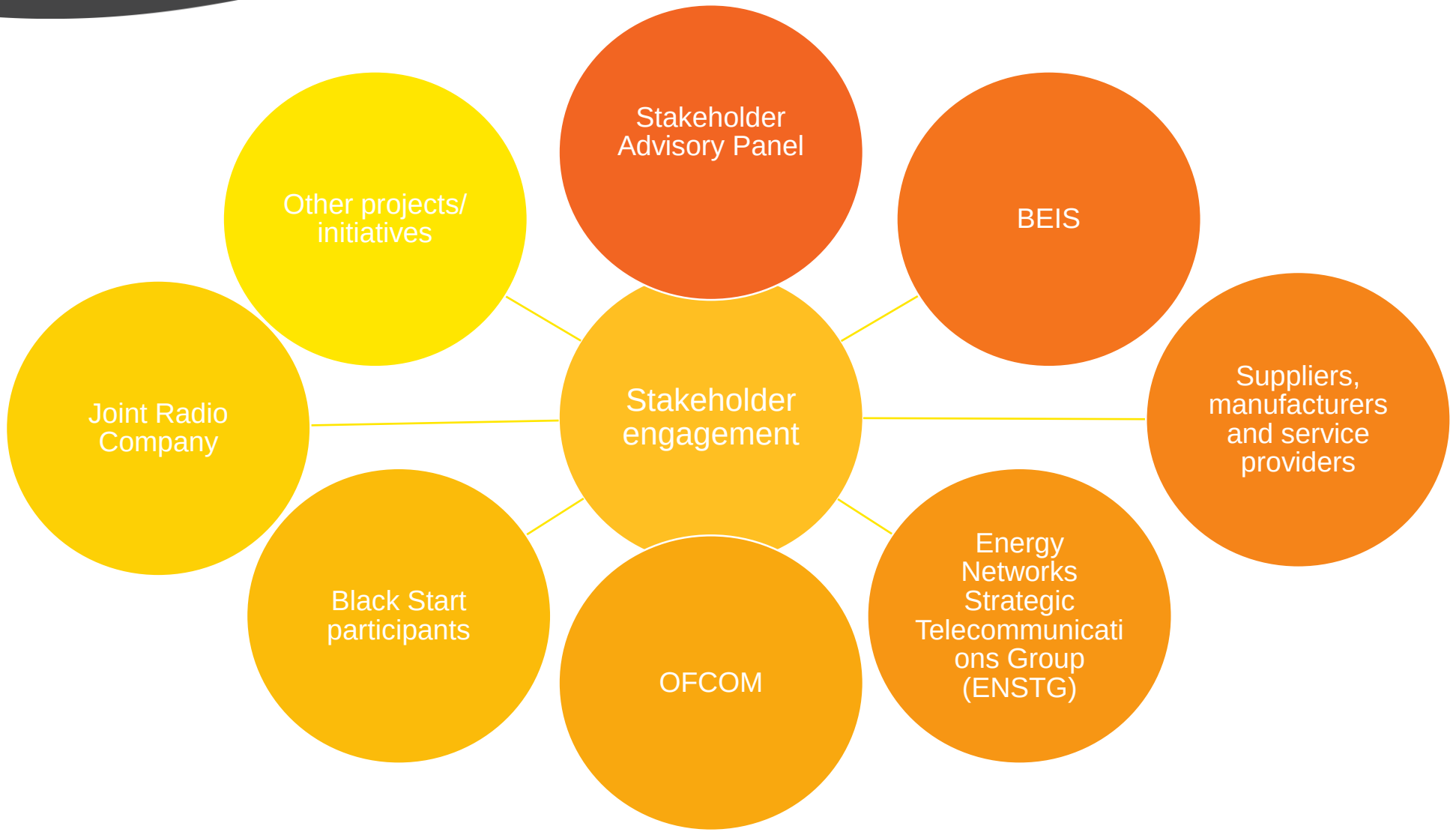
- Number of data points?
- Amount and types of Operational Telecommunications?

Telecommunications resilience

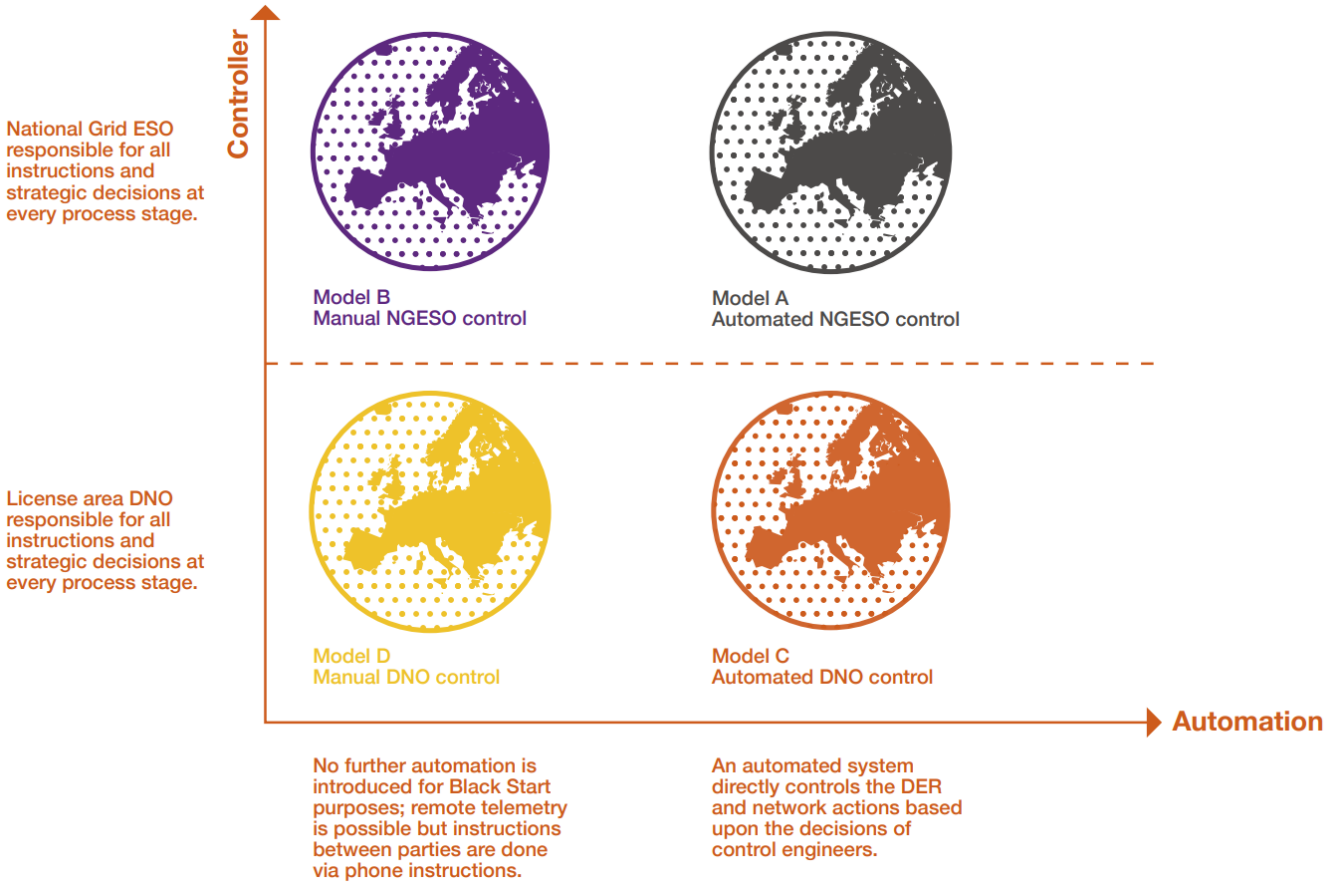
- Inclusion of DER presents challenges across all areas of resilience



Stakeholder Engagement



Organisational Impact



Category	Organisation	Model A	Model B	Model C	Model D
Control staff	NGESO				
	TOs				
	DNOs				
	Providers/DERs				
Support staff	NGESO				
	TOs				
	DNOs				
	Providers/DERs				
Skill requirements	NGESO				
	TOs				
	DNOs				
	Providers/DERs				
Training processes	NGESO				
	TOs				
	DNOs				
	Providers/DERs				
Supplementary criteria	Meets Black Start needs				
	Ease of Implementation				
	Flexibility for the future				
	Alignment with wider industry change				

Operational Telecommunications – Existing

The assessment of Operational Telecommunications to date has included a review of:

- Existing voice and data communication infrastructure
  - Technologies
  - Ownership, capabilities and features
  - Resilience (power, cyber, physical)
- Services that run over the infrastructure
  - Voice communication and features delivered
  - SCADA traffic
  - Other data service requirements including protection, frequency measurements
- Systems
  - What systems and functionality being delivered

What are the gaps?

What is changing in the energy and telecommunication industries?

Operational Telecommunications – potential

Available technologies to deliver resilient telecommunications

- What is currently available or could be available in next 2-3 years
- Options to deploy: build new or extend existing infrastructure?
- How will the system integrate with other systems in the network?

Assessment

- Reliability and availability
- Ease of deployment
- Cost of deployment and ongoing operational cost
- All viable options are being considered

Initial findings

- No one size fits all
- Cost of deployment will vary
- Automation is likely be to required

Technologies considered

- Fibre
- Satellite
- Microwave
- BT Openreach fibre and ethernet services: FTTP, FTTC, EAD, EBD
- 4G LTE, 5G
- Public mobile services, Airwave
- Private Mobile Radio

Conclusions

Key finding: No OST blockers to delivering Distributed ReStart.

Requirements for design phase:

Flexibility: There is unlikely to be a ‘one size fits all’ solution

Resilience: End-to-end Operational Telecommunications resilience required (including power resilience and resistance to cyber or physical attack).

Familiarity: Black Start responsibilities, interfaces and systems should align closely with BAU operations where possible.

Next Steps

- Build workable manual processes
  With stakeholder consultation
- Identify the organisational, systems or automation requirements around pinch points
- Align with models being developed across industry
  Where appropriate
- Define data and telecommunication exchanges
  Functional specifications for systems and operational telecommunications (including resilience requirements)
- Refine and map processes to develop:
  Economic and technically viable processes and resourcing requirements

Distributed ReStart

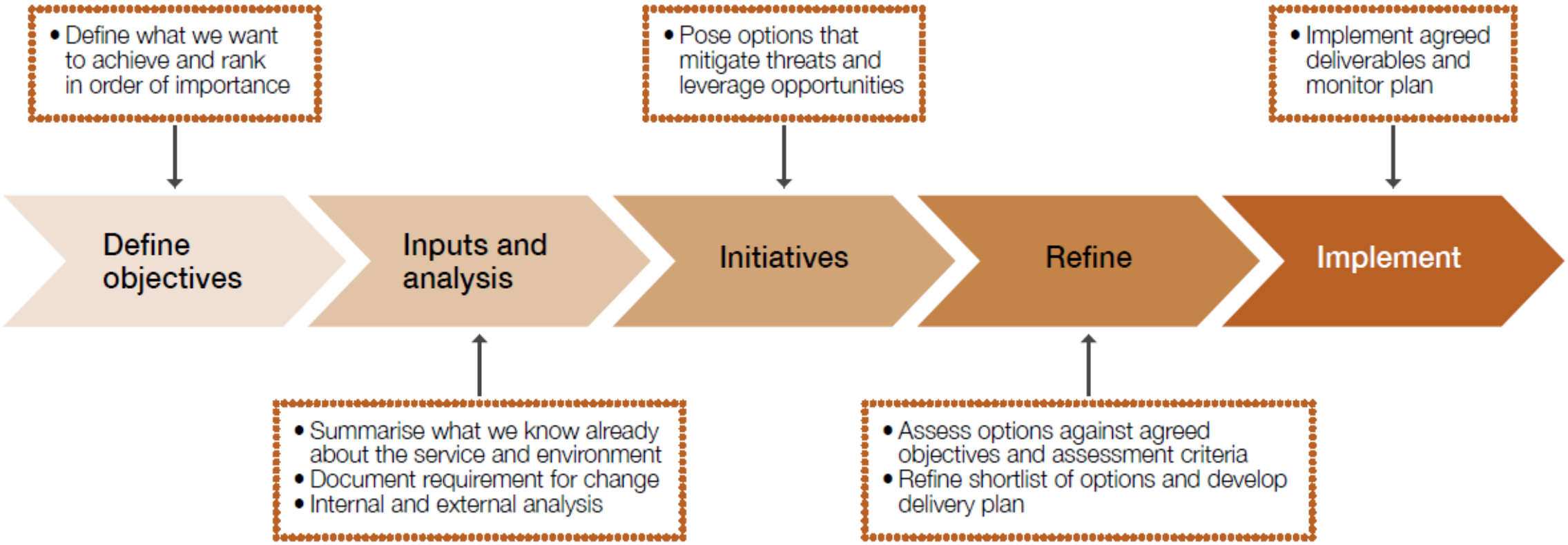
Sophie Corbett
Procurement & Compliance Lead

Methodology

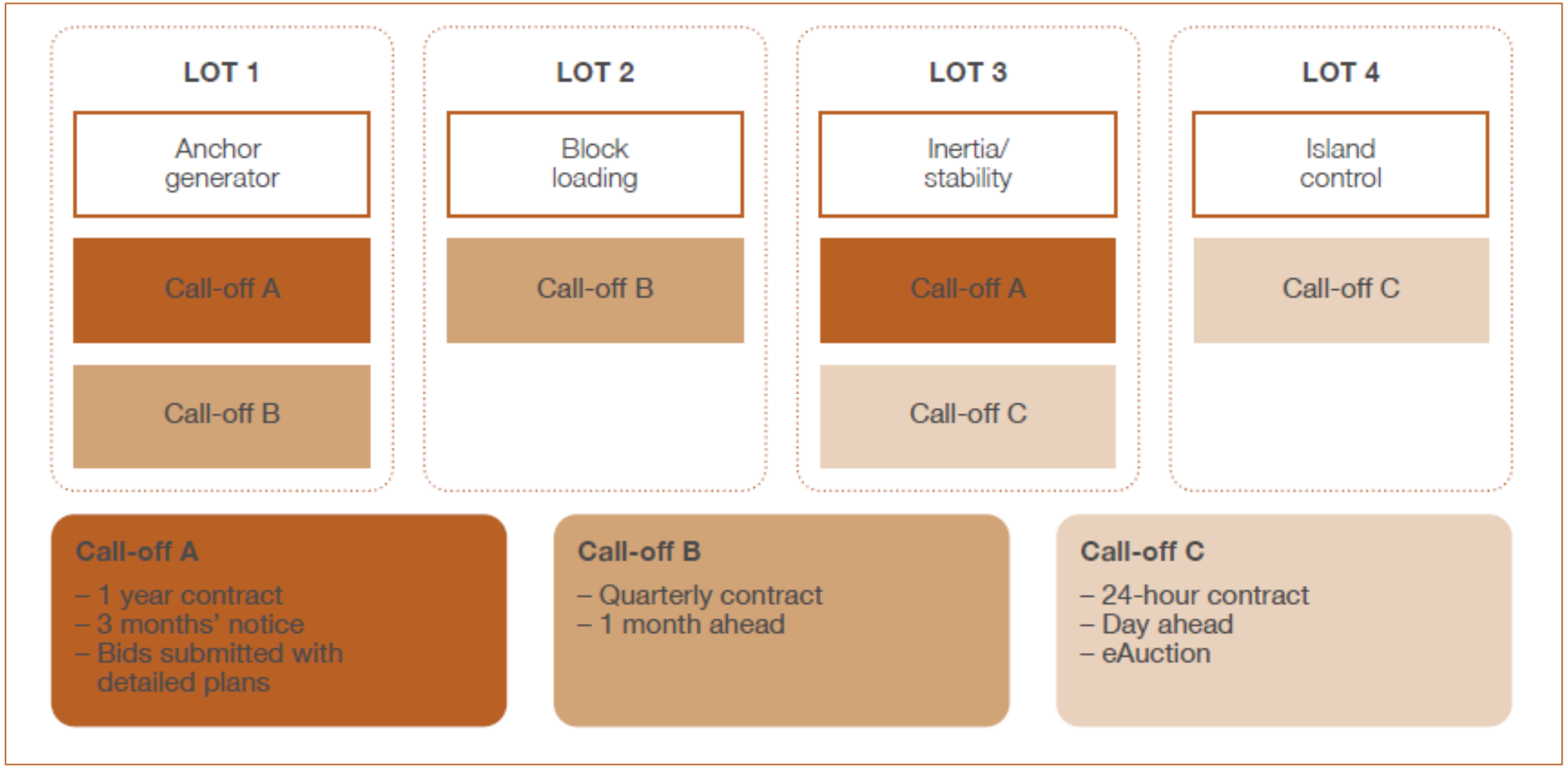
Our approach has been to:

- Outline a strategic process for developing the procurement process and commercial structures
- Apply what we know already to the outlined process to provoke thought and underpin stakeholder engagement
- Review codes and license conditions to identify gaps and blockers

Strategy development process

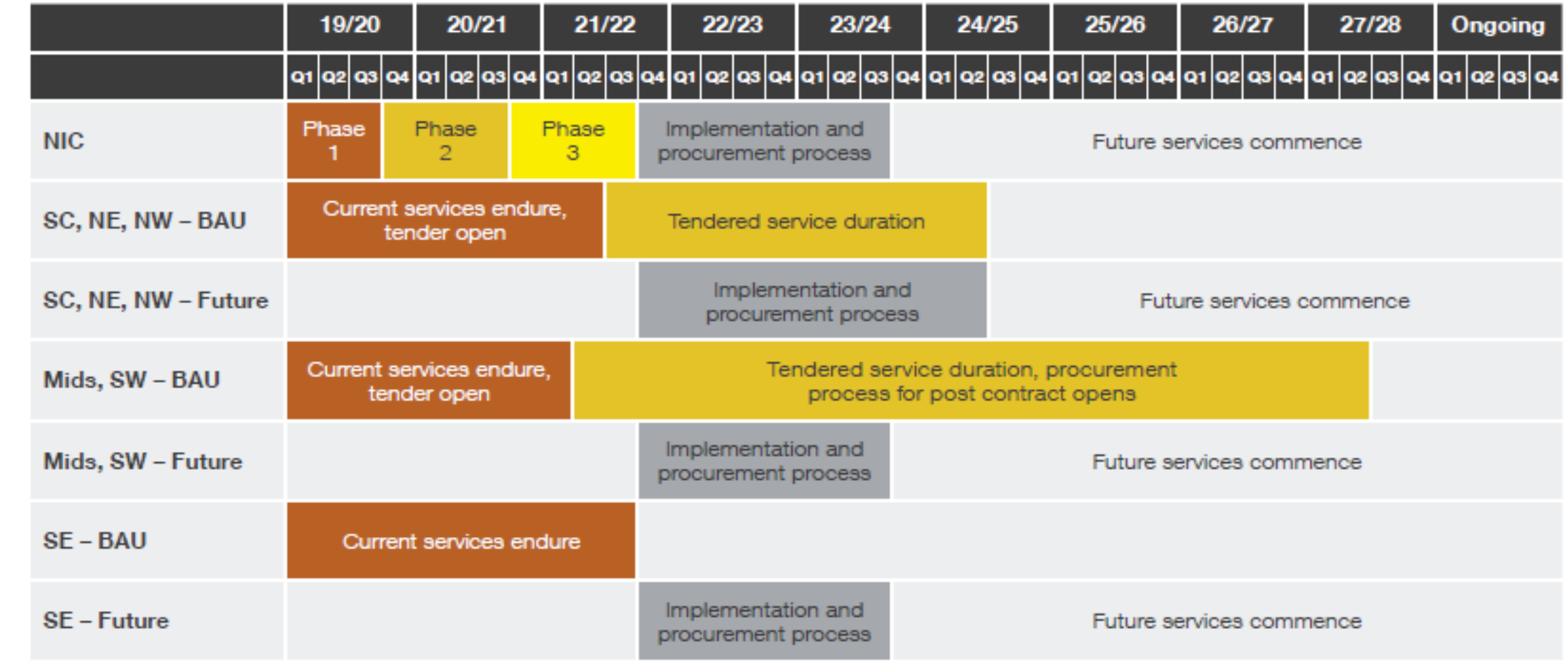


Options – worked example



*for illustrative purposes only

Opportunities



Review of Codes, Regulations, Policies and Standards

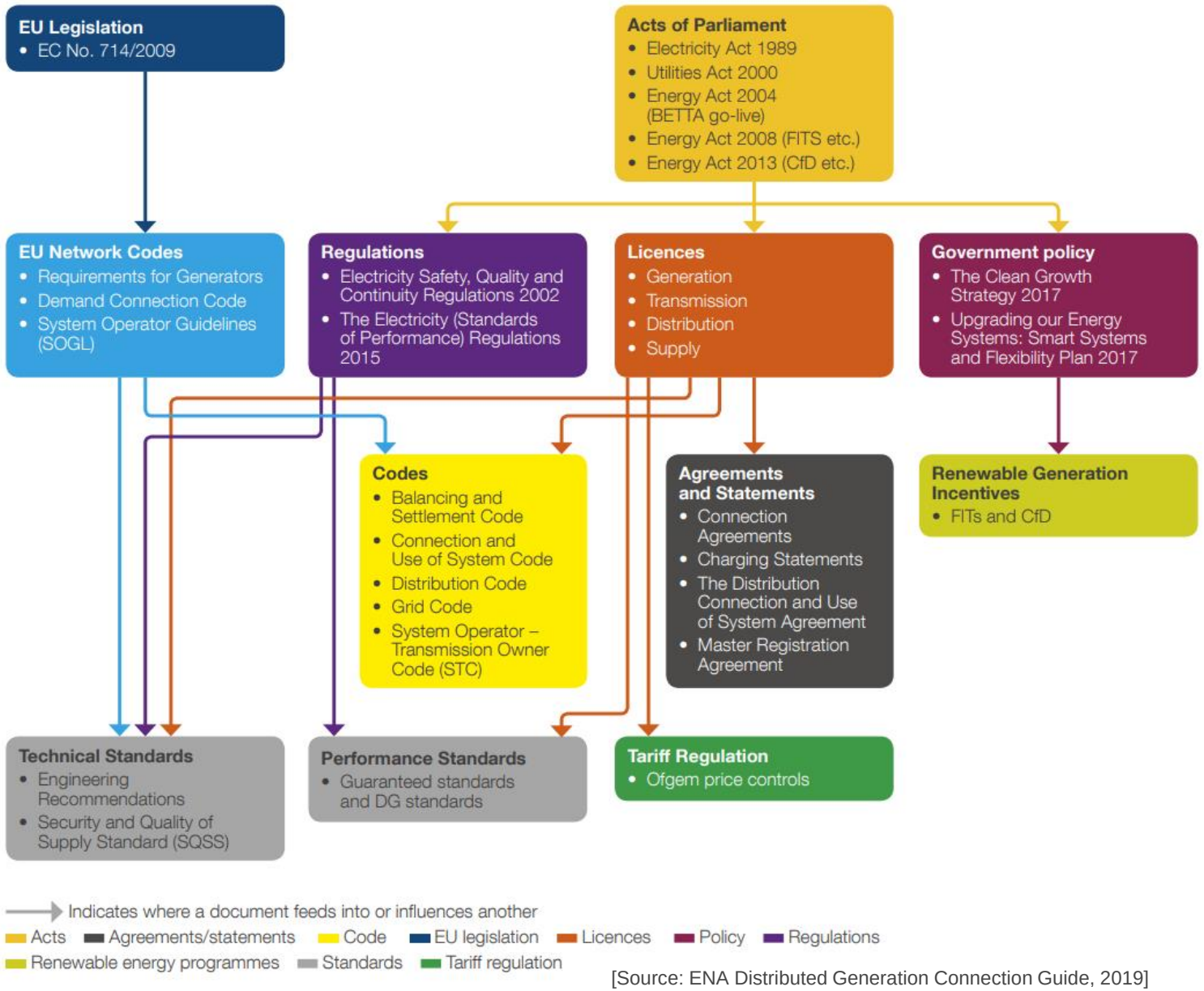
Network operation is governed by a range of policies, regulations, codes and standards.

Third Energy Package of EU Network Codes

- Three Grid Connection Codes
- Three Market Guideline Codes
- Two System Operation Codes

Review of Current GB Codes, Standards & Regulations

- Grid Code
- System Operator Transmission Owner Code (STC)
- Distribution Code
- Security and Quality of Supply Standard (SQSS)
- Electricity Safety, Quality and Continuity Regulations (ESQCR)
- Engineering Recommendations – G99, P2, P28, P29 and G5
- Connection and Use of System Code (CUSC)
- Distribution Connection and Use of System Agreement (DCUSA)
- Balancing and Settlement Code (BSC)
- Telecoms & Cyber Security (various)



[Source: ENA Distributed Generation Connection Guide, 2019]

Review of Codes, Regulations, Policies and Standards
Key Findings

The review did not identify any significant gaps or blockers for Distributed ReStart services.

Many of the documents require minor changes or no change at all, although it would be useful to align certain conditions.

A number of the codes will require some key changes to ensure they capture the requirements for a novel restoration philosophy. (ESQCR, Grid Code, Distribution Code, G99)

It is also crucial to ensure consistency across some key codes such that all parties are defined and each is clear on their roles and responsibilities in different scenarios and tasks, and to ensure parity across license areas e.g. Grid Code, Distribution Code

No changes required	SQSS P2
Minor changes required	STC P28 P29 G5 BSC DCUSA CUSC G91
Some changes required	ESQCR Grid Code Distribution Code G99

Review of Codes, Regulations, Policies and Standards Horizon scan

Looking to the future of Distributed ReStart, there are a number of ongoing projects and industry initiatives that could impact how Black Start and system restoration scenarios are managed.

1) **EU Network Codes (ENTSO-E)**
   - System Defence Plan
   - System Restoration Plan

2) **Black Start Strategy and Procurement Methodology (NGESO)**

3) **Grid Code Modifications (ESO)**

4) **Other Initiatives**
   - The Clean Energy Package (European Commission)
   - Open Networks (Energy Networks Association)

Review of Codes, Regulations, Policies and Standards
Next steps

A number of key next steps can be recommended based on the code review and associated horizon scan exercise.

- Conduct a thorough review of interdependencies to understand how changing clauses in a specific code or policy impact other documents
- Perform more extensive stakeholder engagement to develop potential solutions for key areas of concern e.g. earthing requirements in the ESQCR
- Continue to monitor ongoing projects and programmes that could impact future requirements for Distributed ReStart. For example, new telecommunications and Cyber Security standards, being developed under Open Networks, could impact how Black Start participants implement telecommunications and telemetry facilities at their sites
- Produce a timeline of known changes to relevant codes and policies e.g. introduction of the Black Start Standard in 2020, to better understand the impact of / on the Distributed ReStart project

Summary

We look forward to engaging with our industry colleagues to shape our workstream outcomes.

Join our annual event https://www.eventbrite.co.uk/myevent?eid=76213890799

Viability Stage Technical Reports
PET https://www.nationalgrideso.com/innovation/projects/distributed-restart
P&C https://www.nationalgrideso.com/document/156221/download
OST https://www.nationalgrideso.com/document/156216/download

Progress Report https://www.nationalgrideso.com/document/159801/download

Stay up to date through our web-page
https://www.nationalgrideso.com/innovation/projects/distributed-restart

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Any Questions?

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