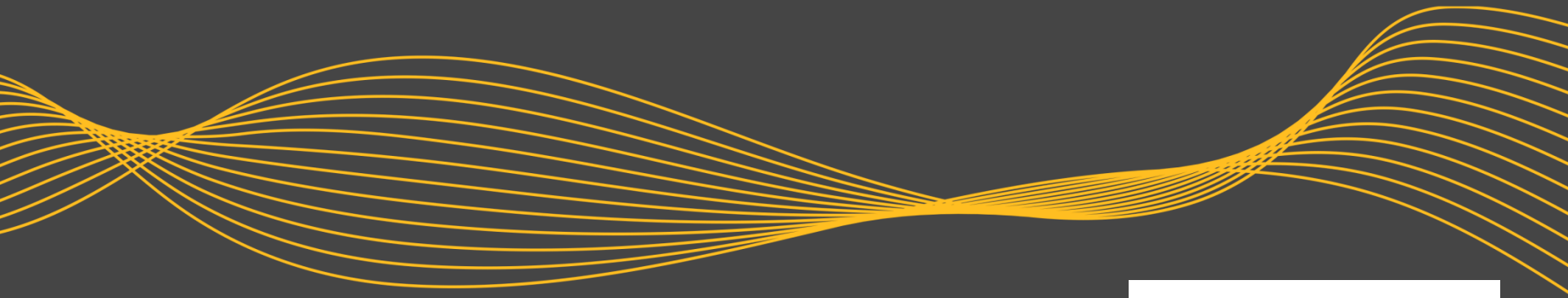
Distributed ReStart

Cian McLeavey-Reville
Innovation Manager



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ESO Innovation

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Innovation Manager

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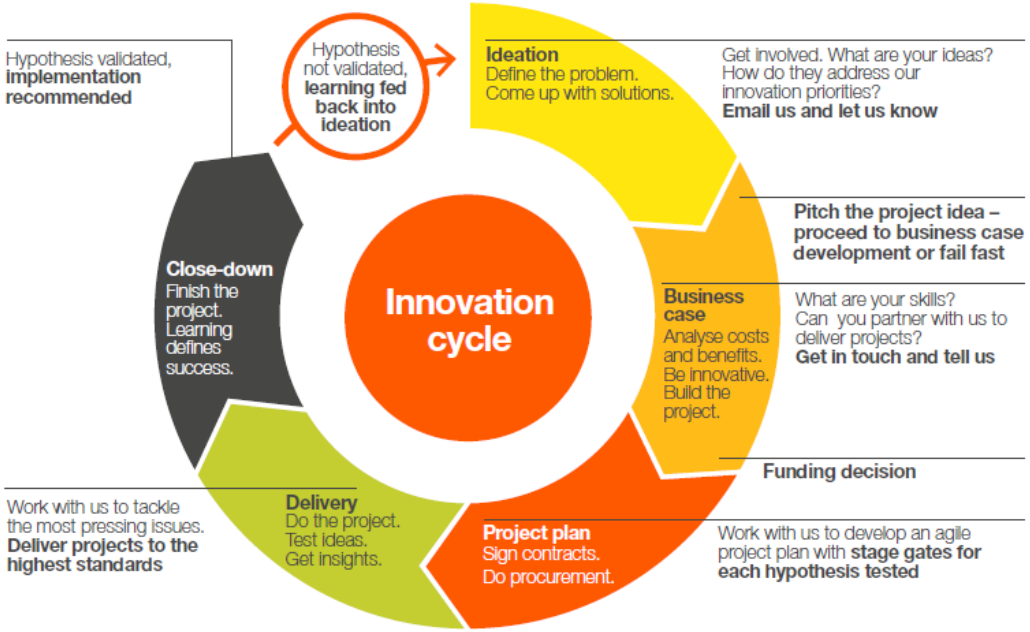
ESO Innovation role and guiding principles

Innovation is a key enabler for the ESO to fulfill its mission and facilitates the wider energy industry transform to a more sustainable and decarbonised future

- Safe and agile environment to explore and address medium to long-term challenges
- Align effort to strategy, create new value for consumers and society
- Collaborate with industry partners and wider stakeholders
- Trial immature technologies that need to be proven and derisked
- Ensure benefits are realised from proven, implemented innovations and an innovation culture is embedded across all levels of ESO



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A Cost Benefit Analysis determines whether project ideas get funded

Strategic relevance

Ensure projects are aligned with SO innovation priorities

Technical Merit

Ensure projects are innovative yet achievable

Benefits

Ensure innovation projects provide significant benefit to the system and consumer

Costs

Estimate all costs associated with achieving stated benefits (innovation project, implementation, ongoing operation)

Risks

Ensure relevant risks identified and appropriate mitigations put in place

Existing Activities

Ensure project is additional and complementary to existing projects

- Improved safety and reliability
- Improved quality of service
- Lower bills
- Reduced environmental damage
- Benefits for society as a whole

The ESO Innovation Strategy is derived from a combination of top-down and bottom-up approaches

Top-down

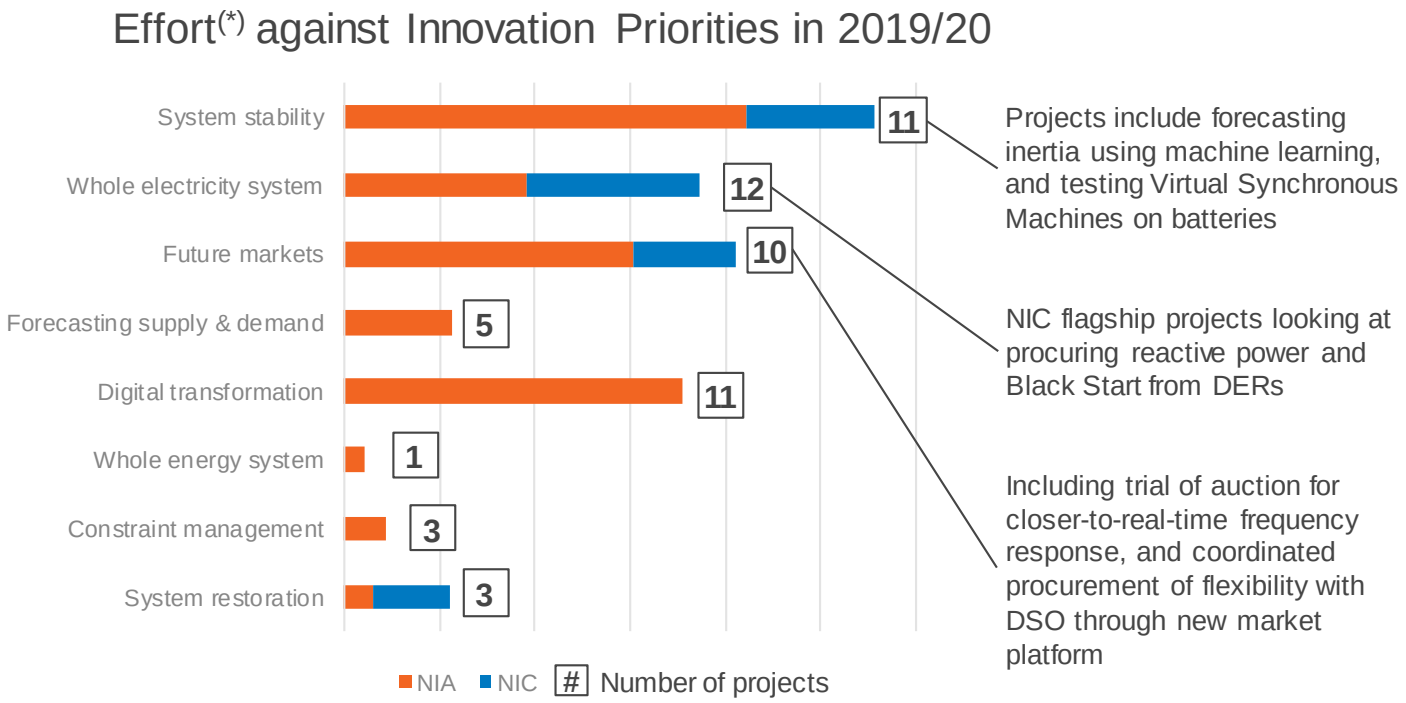
- ESO 2030 strategy

Prioritisation

Security | Cost | Customer | Urgency

Bottom-up

- Stakeholder feedback
- ESO expert views



(*) Effort is calculated as £spend against each priority by every project that was live in the financial year. £ allocated to priorities based on whether project tackles priority directly or indirectly. £spend is total registered value of projects

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How ESO Innovation supports Distributed Restart

Strategy targets areas that need innovation

Open call for ideas to tackle subject

Collaborate with ESO SMEs and partners to create project scope and bid

Secure funding, contract with partners, register project

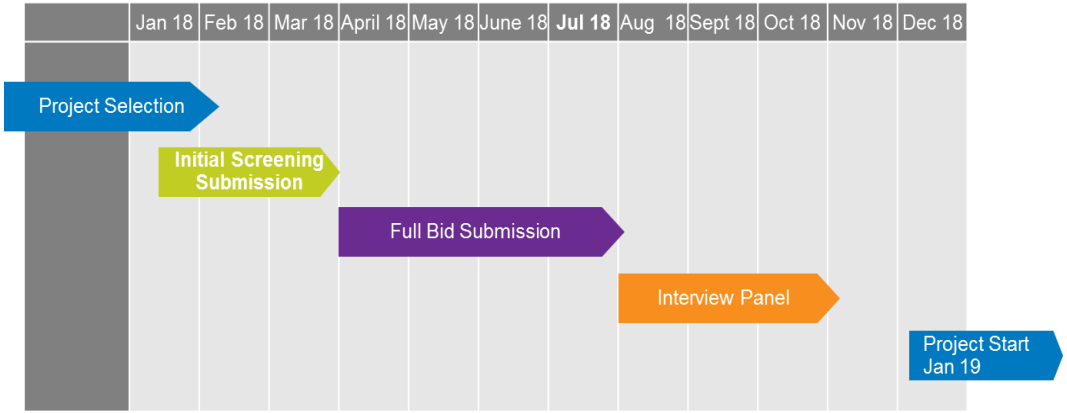
Support project through delivery and implementation

Ensure benefits are realised and tracked

Public Call
- 37 Innovation Ideas were received

Prioritisation
- Submissions shortlisted against strategic priorities

Selection
- TNEI submission of ESO/DSO Emergency Coordination was selected



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Open Innovation Event 2019

87 submissions

11 ideas taken forward to the event

3	Stability
3	Whole electricity system
5	Digital transformation

>40 Representatives attended from academia, consulting, technology and software firms

7 projects being funded, worth ~£2m, ESO funding ~£1m

£1m	£1m
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… a very innovative innovation event!

Quick-fire event was great - idea worked up from fairly embryonic to securing funding in two days

"…my first time at such an event and can't think of a single way it could be improved. The 2 day format worked well."

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Open Innovation Event projects funding approved

Project	Total Budget	Key Target Benefits
Measuring and Managing Uncertainty in System Operation	£300,000	Increase the visibility of how uncertainty propagates through NGESO processes in the control room.
Techno-Economic Optimisation of the LFDD Scheme	£300,000	Reduce economic impact and number of disconnected customers, by revisiting our approach to the Low Frequency Demand Disconnection (LFDD) scheme to consider the Value of Lost Load (VOLL)
Coordination of ANM schemes with ESO balancing services markets	£250,000	Reduce costs of balancing and improve security of supply through coordinated Active Network Management (ANM) schemes
Probabilistic planning for stability constraints	£250,000	Reduce time required to run the probabilistic modelling process and increase time to undertake much more granular assessments of system stability in our economic assessment and planning process

OIE projects – conditionally approved

Project	Total Budget	Key Target Benefits
4D Heat	£200,000	Reduce spend on constraints and network reinforcement, by looking at how electric heating might be used to solve transmission and distribution constraints in Scotland (assuming level of electric heating will be rolled out).
Fault ride through using EV chargers	TBC	Lower BSUoS charge through less actions taken in control room due to procured service from chargers and reduce transmission build due to DNOs managing constraints, by exploring how EV chargers could provide fault ride through services to the grid..
Optimal Outage Planning System	£200,000	Improve security of supply and reduce delayed outages for customers, by better estimation of risk of maintenance measures and allowance for more maintenance to take place
Geovation EnergyTech Accelerator	£50,000	Expand innovation activities and collaboration outside industry, by greater exposure to start-ups (and SMEs), outsourcing some scouting for ideas and partners, early development of ideas into proposals, and more collaboration with cross-sector partners to understand common ‘energy transformation’ challenges