Network Options Assessment

RIIO-2 Costs & Outputs working group
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The NOA aims to help our industry ensure a secure, sustainable and affordable energy future

What is the NOA?

- The NOA recommends which Transmission Owner proposed investments would best manage the capability of the GB transmission network against the uncertainty of the future

Why undertake the NOA?

- We need to balance asset investment, network management and consumers' money
- The energy landscape is uncertain – NOA helps manage this uncertainty

NOA 2017/18

- Recommend £22.1m investment in 2018/19 across 22 projects that can deliver £3.2bn investment across their lifetime

What NOA is and what NOA isn't

What the NOA can do

- Recommend the most economic options to proceed to meet bulk power transfer requirements as detailed in ETYS
- Recommend what, where and when transmission investments should be made to facilitate an efficient, co-ordinated and economic future transmission system
- Recommend starting, stopping or delaying reinforcement projects to make sure they are completed at a time to deliver the most benefit to consumers
- Indicate projects eligible for onshore competition

What the NOA cannot do

- Insist options are pursued. This is for TOs and others to ultimately decide.
- Make recommendations for system needs other than bulk transfer (for now)
- Comment on possible planning, delivery or deign details. TOs decide how to implement their options.

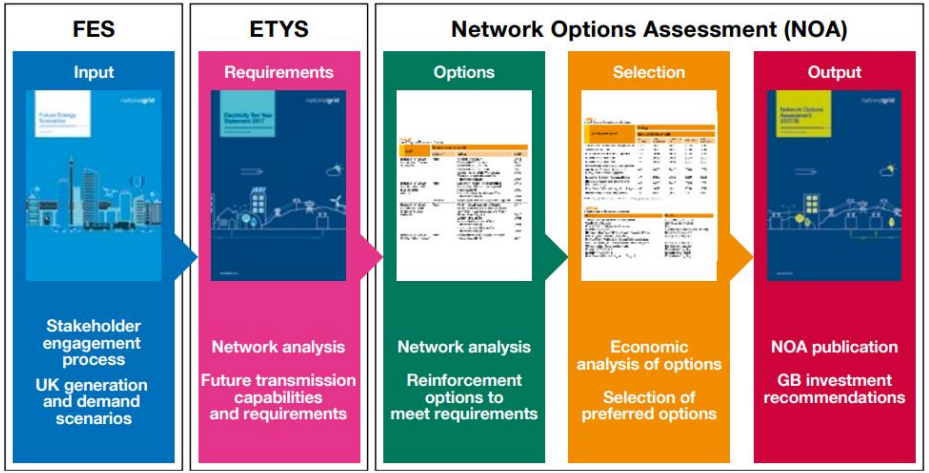
The NOA utilise the information provided by FES and ETYS

Future Energy Scenarios (FES)

- Plausible range of scenarios for the future energy landscape to 2050
- Foundation for the studies and economic analysis

Electricity Ten Year Statement (ETYS)

- Applies FES to power system models
- Calculate power flows across transmission network using boundaries
- Details capability of the GB electricity transmission network and future requirements under different FES scenarios



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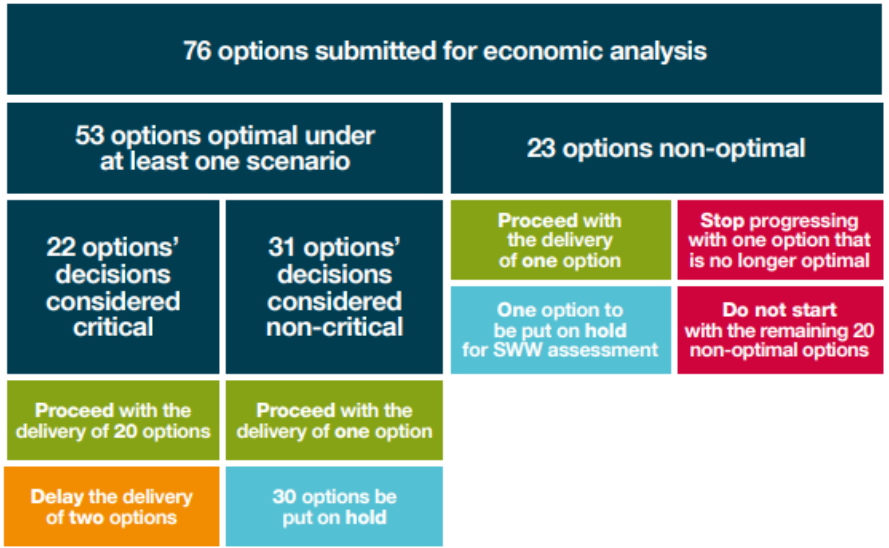
NOA 2017/18 process and statistics

TOs submit options

Create optimal path for each FES scenario (lots of combinations!)

Analyse critical options using methodology (least worst regrets)

Recommendations



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TOs can propose a number of different options; the NOA considers these against a range of costs

Potential transmission solutions

Build options

- New build
- Switchgear or cable replacement
- …

Alternative options

- Storage
- HVDC de-load
- Automatic switching
- Intertrip
- …

Cost modelling assumptions and inputs

- Fuel price forecasts
- Carbon price
- Plant efficiencies and season availabilities
- Renewable generation
- Demand data
- Demand profiles
- Maintenance outage patterns
- System boundary capabilities
- Reinforcement incremental capabilities

NOA methodology for assessing critical options

NOA aims to balance constraint costs associated with bulk transfer of power with investment costs of alleviating these constraints

It uses the principle of single least worst regret (i.e. the worst we could have failed to gain having chosen a particular scenario). This minimises the risk to consumers.

Main steps:

1. TO options have an EISD (Earliest In Service Date) and an optimum year of delivery. To avoid investing too early or too late we analyse “critical” options, where these years are the same.
2. We calculate the regret of different combinations of TO options under each scenario.
3. We choose the strategy with the least worst regret under all scenarios.

Hypothetical Example (1/2)

We calculate the net benefits and regrets of different strategies across a single scenario….

Scenario A	Strategy 1	Strategy 2	Strategy 3
Initial investment cost	£40m	£20m	£60m
Savings in constraint costs	£420m	£220m	£460m
Net benefit	£380m	£200m	**£400m**
Regret	£20m	£200m	**£0m**

Hypothetical Example (2/2)

…and repeat across all scenarios to find the single least worst regret

		Strategy 1	Strategy 2	Strategy 3
Net Benefit	Scenario A	£380m	£200m	**£400m**
	Scenario B	£120m	**£165m**	£125m
	Scenario C	**£350m**	£50m	£250m
	Scenario D	£160m	£150m	**£185m**

		Strategy 1	Strategy 2	Strategy 3
Regret	Scenario A	£20m	£200m	£0m
	Scenario B	**£45m**	£0m	£40m
	Scenario C	£0m	**£300m**	**£100m**
	Scenario D	£25m	£35m	£0m
Worst regret		**£45m**	**£300m**	**£100m**

Least worst regret → Proceed (subject to NOA committee and implied probability considerations)

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Find out more

https://www.nationalgrideso.com/insights/network-options-assessment-noa

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