Pathfinders Present and Future

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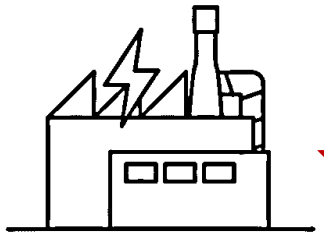
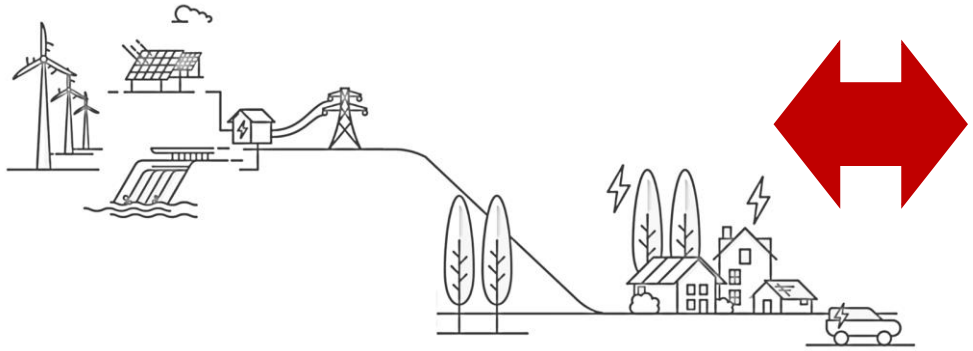
Decarbonisation leading to changing generation technology & location



Less dispatchable synchronous generation



Generation moving to different areas

More variable sources of generation

More asynchronous generation

Impact of generation changes

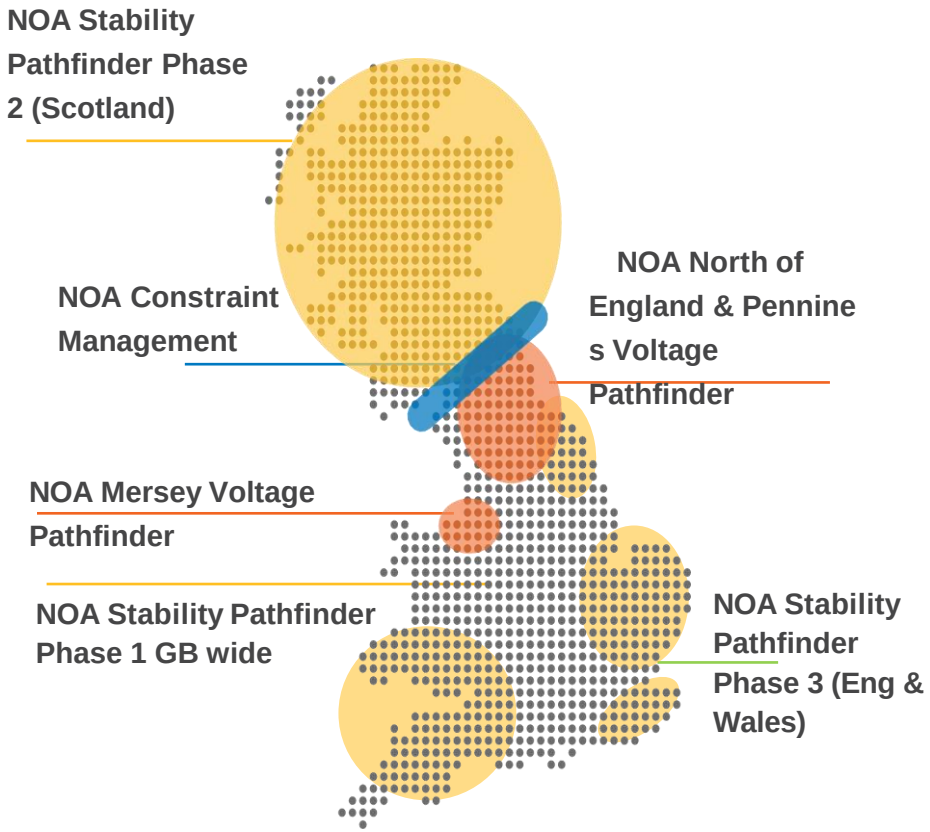
- Increase in boundary constraints as flow patterns change
- Less synchronous plant on the bars leading to
    - Reduction in inertia
    - Reduction in generation with MVAr range
    - Increase in short circuit level (SCL) requirements
- **Need to find solutions/secure services to ensure the Network is compliant and run efficiently to meet Net Zero targets.**

What are Pathfinders?

- A set of trial processes to procure new system services
- Each project building on the learning from previous ones
- Define the ESO need – allow the market to innovate
- Seek solutions at lowest cost to consumers to resolve current and future operability & cost challenges
  - Stability : Inertia, SCL, dynamic voltage
  - Voltage
  - Thermal constraints
- Compete solutions from commercial parties & counterfactual solutions from incumbent transmission operators
- Where appropriate provide 6 or 10 year long term contracts to stimulate investment in new service capacity.

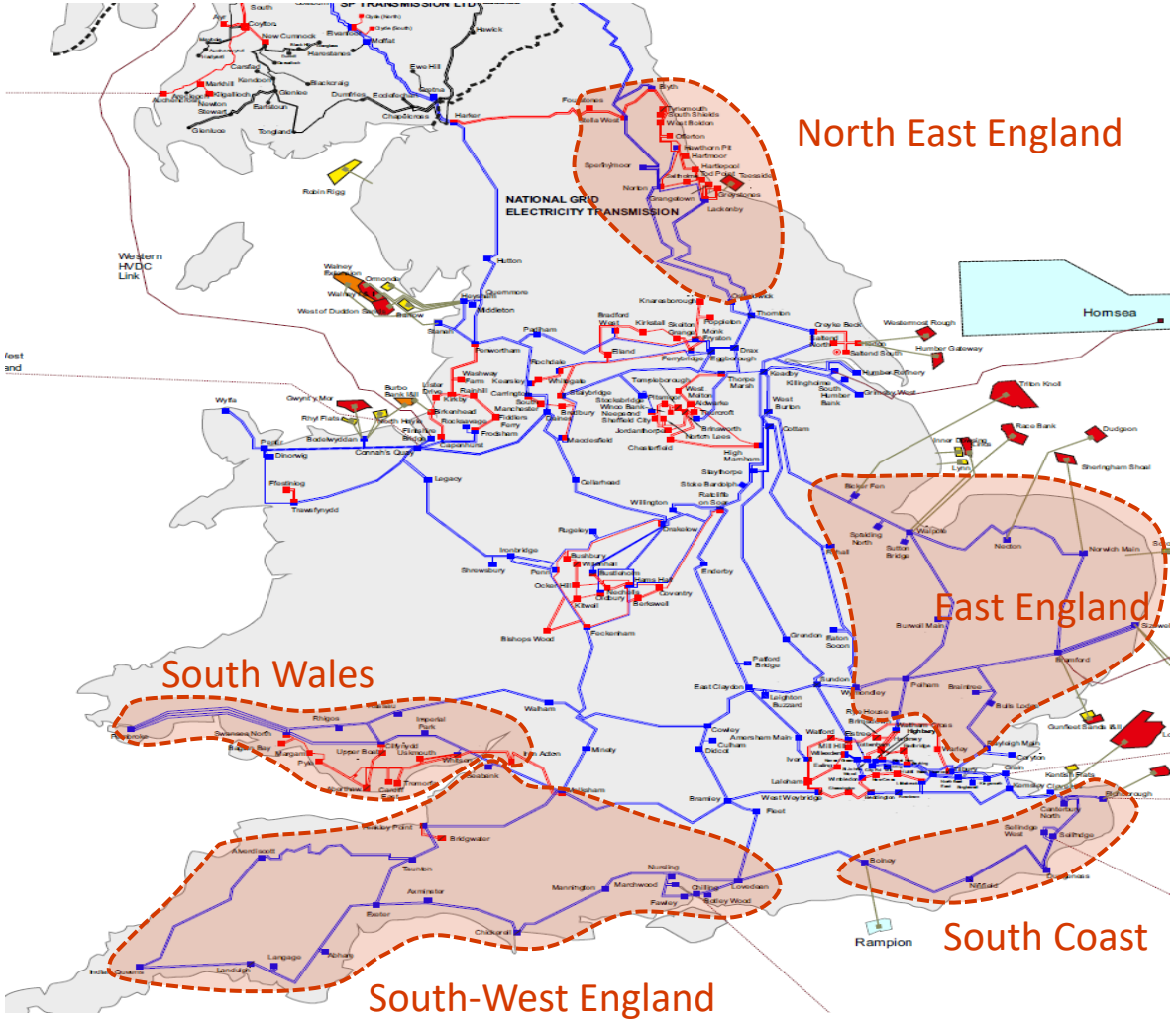
Overview of Pathfinders so far

Pathfinder	Requirement	Status	Participating Technology
Stability Phase 1 (GB Wide)	Inertia and dynamic voltage	Tender concluded with some units now live	0MW Synchronous Compensators only
Stability Phase 2 (Scotland)	Inertia, Short Circuit Level and dynamic voltage	Tender concluded – winners published	Synchronous and Grid Forming Convertor based
Stability Phase 3 (England and Wales)	Inertia, Short Circuit Level and dynamic voltage	Tender period - ITT window currently open	Synchronous and Grid Forming Convertor based
Voltage (Mersey)	Voltage absorption	Tender concluded with go-live from Apr 22	Reactor, Battery based
Voltage (Pennines)	Voltage absorption	Tender concluded with go-live from Apr 24	Reactors
Constraint Management (B6)	Post-fault intertrip	Contracts awarded for 2023. Tender upcoming for 2024-25 delivery.	Transmission level generators



Stability 3 – What we have improved

- Bay Reservations
  - Mitigate provider risks
- Site visits
  - Better coordination
  - Earlier access
- Single stage process for tenders
  - Allow providers to submit commercial and technical elements of solutions together



Pathfinders evolution going forward

Future Procurement (~~Pathfinders~~)

- Constraint Management (CMP) – Assess further boundaries
- Assess forward looking voltage needs
- Assess forward looking stability needs
- Aim to signal to the market needs as early as possible.