Confidential

Offshore Design in CSNP

24/07/25

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Session plan

- Our approach to offshore coordination
- How offshore planning links to other NESO processes
- The four stages of our proposed approach for offshore planning in CSNP
- Q&A

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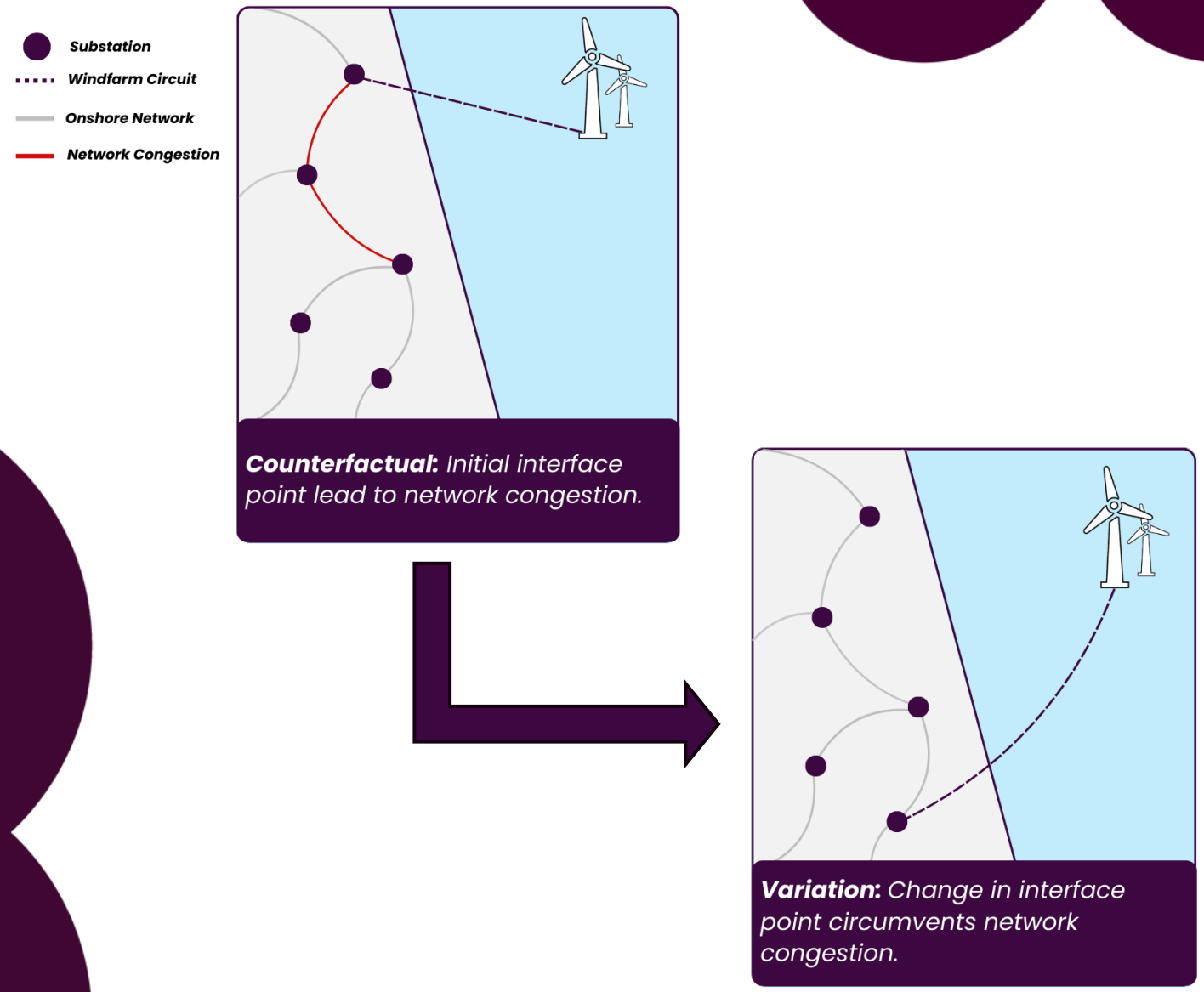
Why have an offshore approach?

Relative to onshore generation, offshore generation is unique

- Much higher capacities than other generators, increasing the impact on the onshore network
- Greater connection flexibility providing an opportunity to optimise/reduce the impact on the onshore network

These unique characteristics mean it is critical that offshore generation assets are planned strategically



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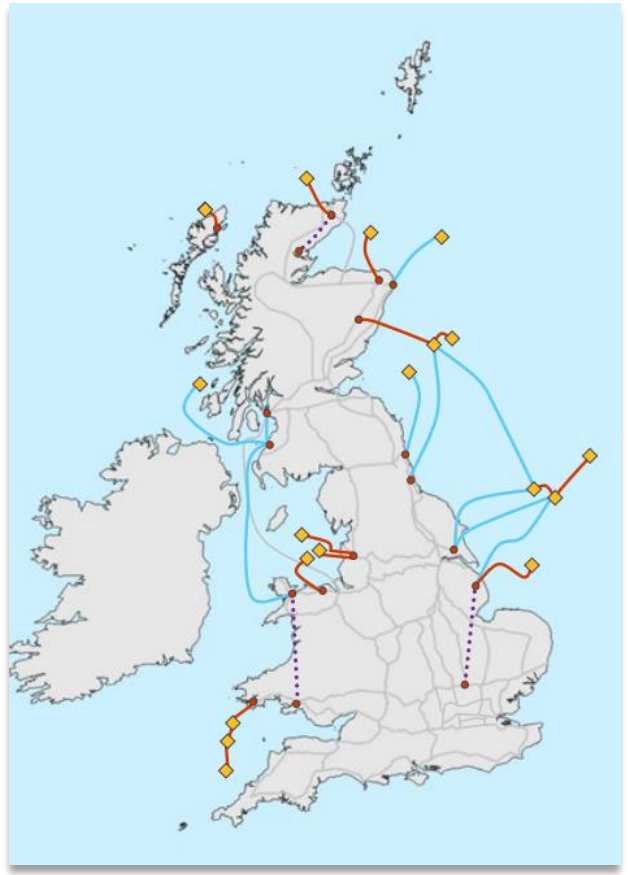
Background

- NESO's previous planning exercises such as the HND and HNDFUE recommended high levels of offshore coordination between offshore windfarms
- This highlights the value coordination can bring, reducing the impact on local communities and the environment
- Since making these recommendations we've supported their further development through the detailed design stage
- Reflecting on these exercises we've learnt a lot and using this we've identified ways to deliver these holistic benefits through different coordination approaches
- We categorise these as **Strategic & Spatial Coordination** and **Electrical Coordination** which we'll combine to develop a holistic offshore design in CSNP



Original HND design July 2022

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Strategic & spatial coordination

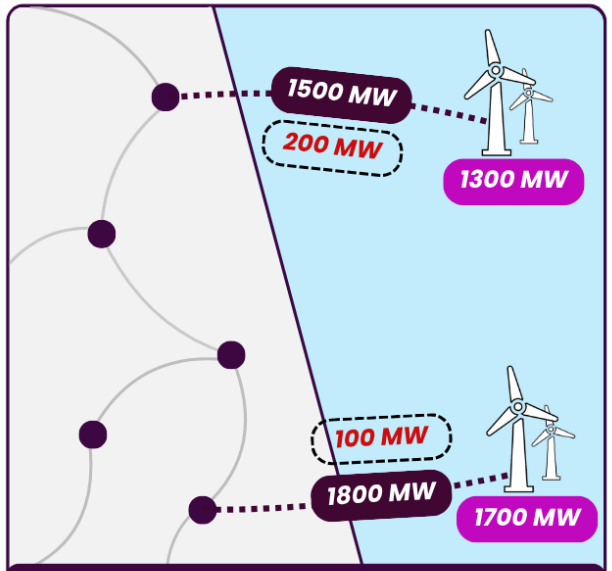
Standardise seabed areas and asset sizes to increase deliverability of designs.

This ensures full utilisation of cable assets, which also reduces the overall number of cable interface points needed.

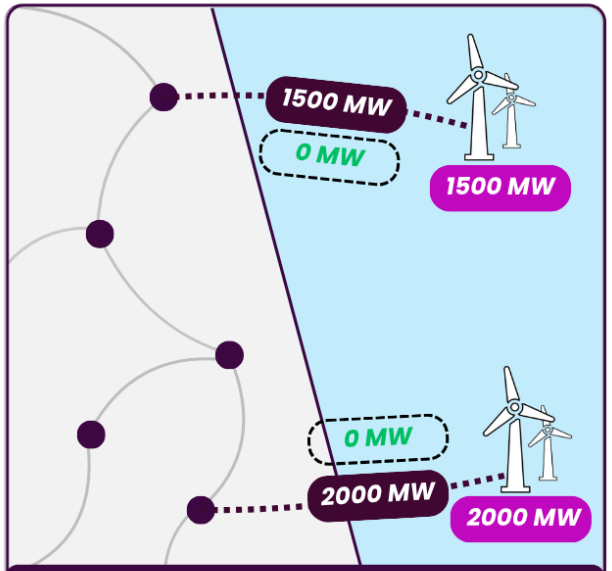
This reduces environmental and community impact.

Table 5: Offshore technology classifications

Technology	Capacity limit per circuit	Voltage
HVAC	500 MW	132 - 275 kV
HVDC Symmetric Monopole	1500 MW	320 kV
HVDC – Rigid Bipole without dedicated Metallic Return (DMR)	1800 MW	525 kV
HVDC - Bipole with DMR	2000 MW	525 kV



Lower energy density *on installed circuits* ***without*** *alignment to standardised export configurations*



Higher energy density *on installed circuits* ***with*** *alignment to standardised export configurations*

Question: Do you agree with our plan to design using current cable standards to provide certainty for connections?

Strategic & spatial coordination

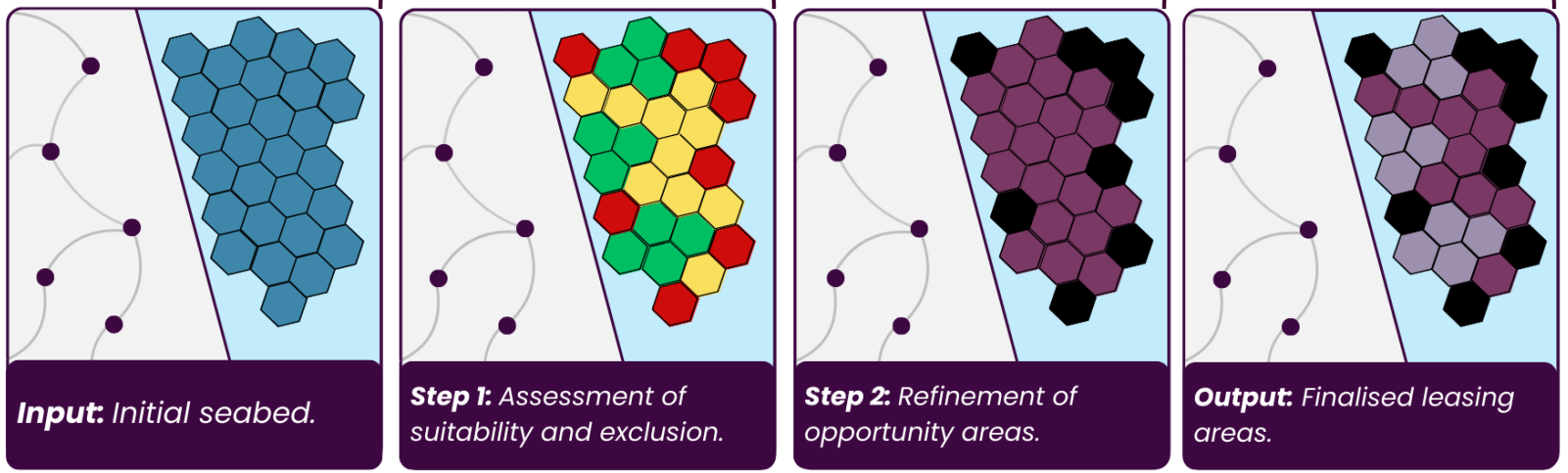
Collaborate with seabed leasing authorities to reduce onshore network impact and align with wider strategic network plans.

This allows leasing to happen in line with the transmission network's capabilities – potentially reducing reinforcement in some cases.

This also reduces environmental and community impact.

Early engagement allows for alignment to SSEP capacities.

Final seabed leases aim to bring maximum onshore network benefits.



Proactive understanding of viable seabed areas inform indicative designs.

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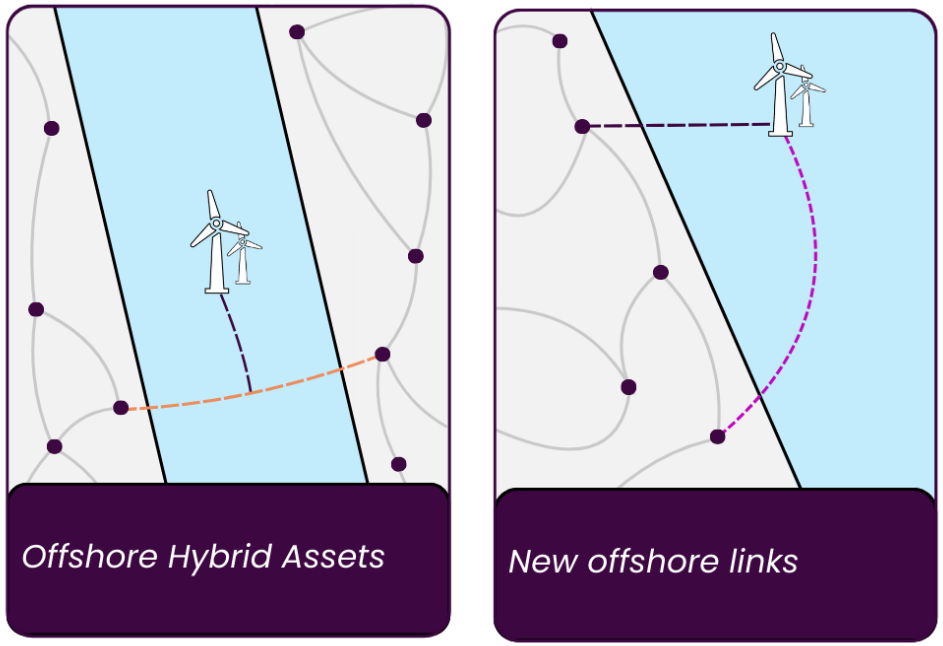
Electrical coordination

Physically connecting offshore assets to create an interconnected network, which can provide:

- Additional redundancy of transmission routes (and therefore resilience)
- Increased asset utilisation
- Reduce onshore network reinforcement needs
- Reduce the impact on the environment and communities
- Facilitate efficient cross border market trading



Question: Do you agree with our approach to utilise both spatial and electrical coordination in developing offshore networks?

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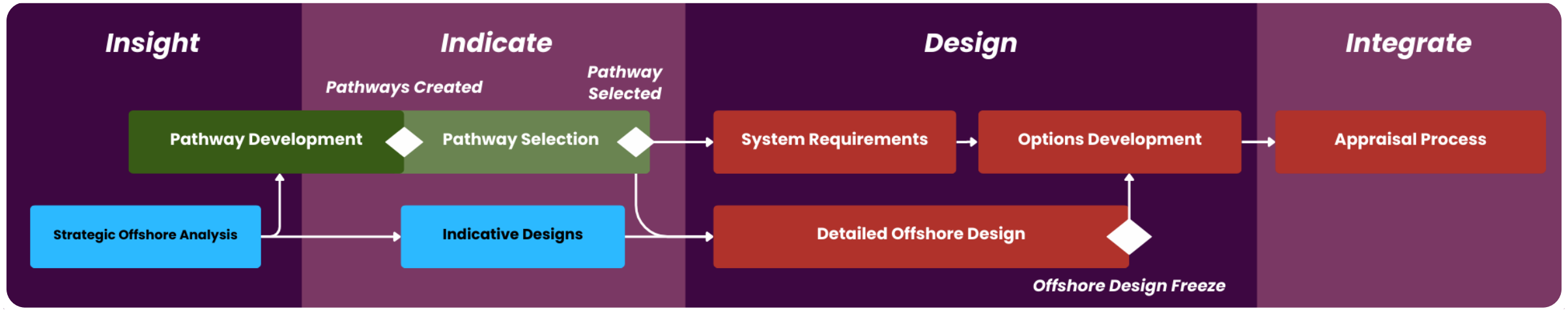
Offshore Planning and NESO Processes

Initial range of designs based on varying pathways and potential seabed areas.

Holistic assessment of onshore and offshore designs



Provides insight to SSEP and informs future design work.

Detailed design using a single pathway and considers coordination in greater depth.

SSEP CSNP *Indicative Offshore Design Exercise*

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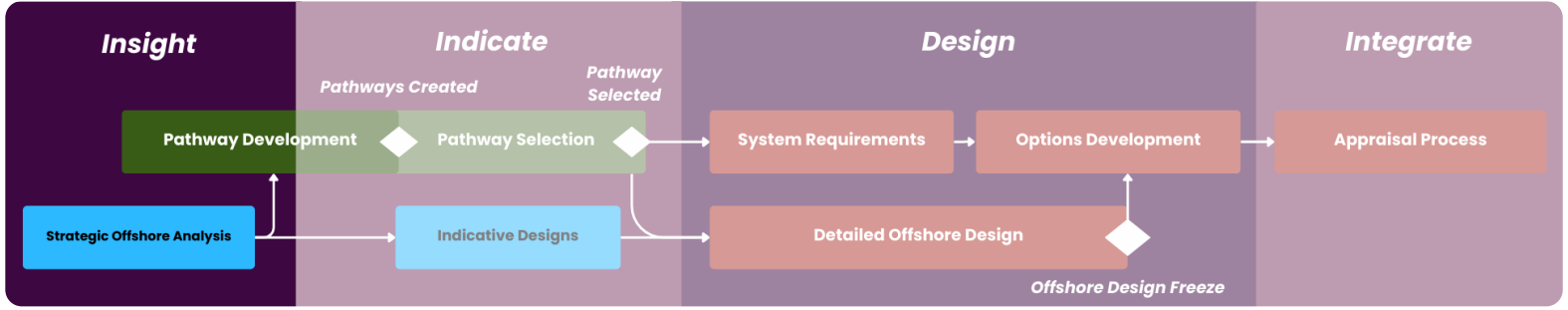
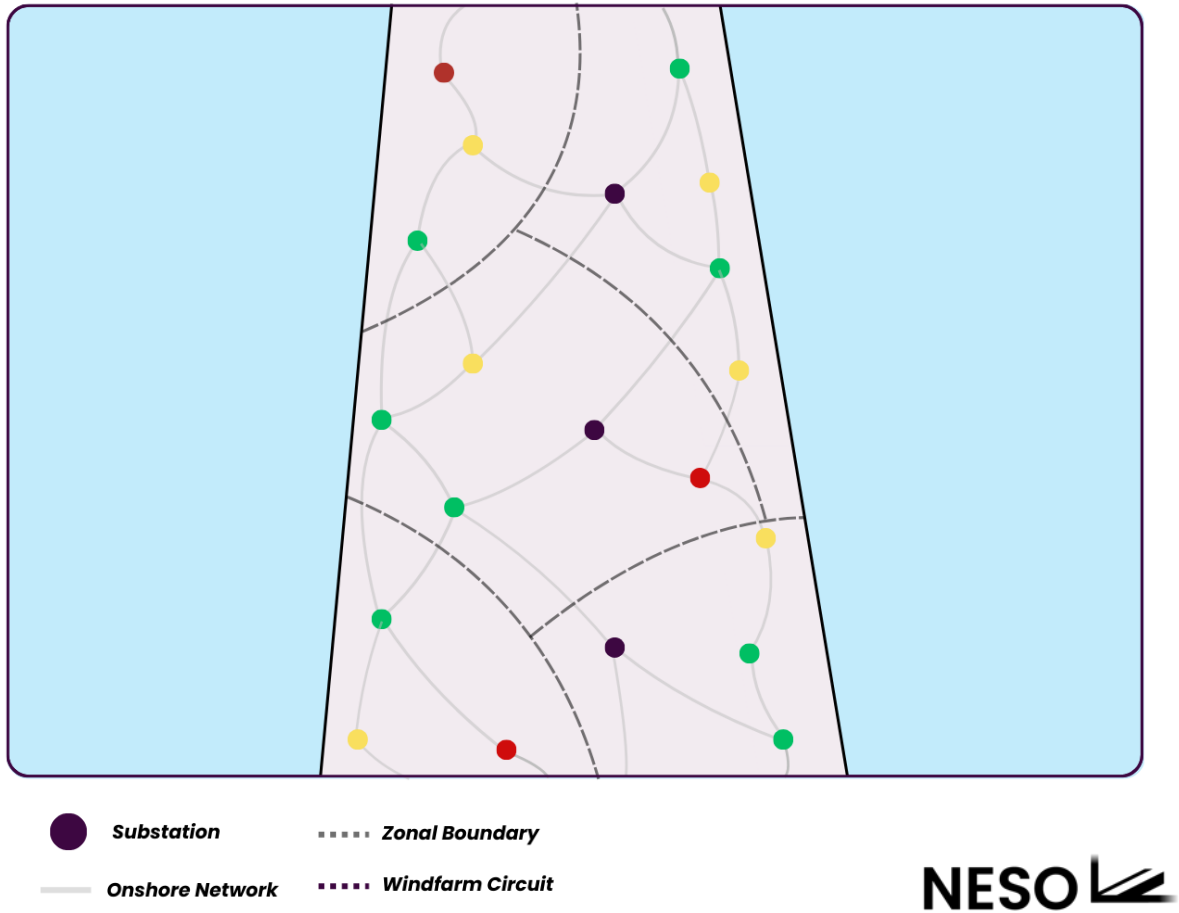
Stage 1: Insight



Insight is shaped by Strategic Offshore Analysis. This provides the evidence base for early offshore network planning considerations. This primarily:

- Maps and ranks potential offshore connection points using technical, environmental, and community criteria to identify the most viable cable routes and landing zones,
- Quantifies potential capacity at each interface point to inform strategic planning and system design for future offshore wind development,
- Supports early-stage spatial planning by identifying opportunity areas and constraints around the GB coastline



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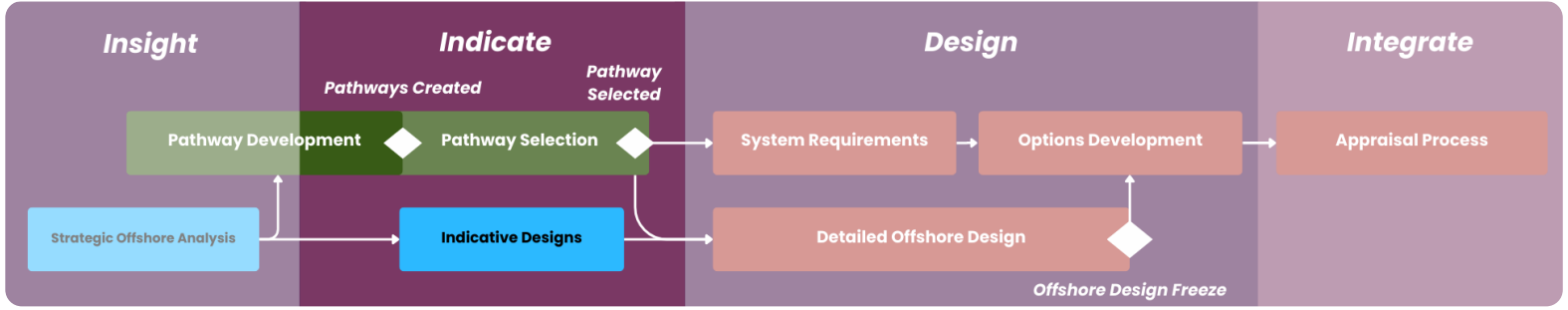
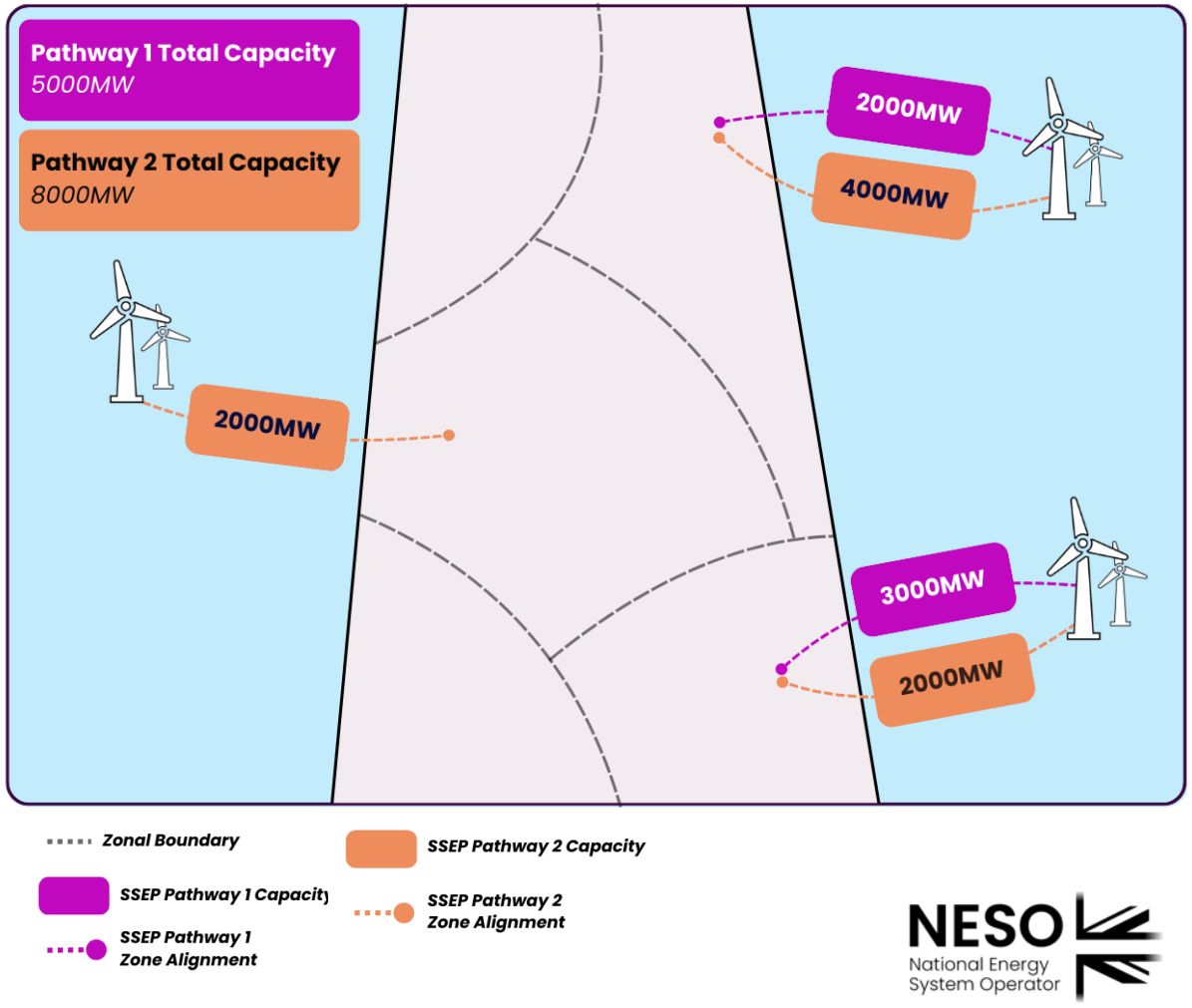
Stage 2: Indicate



Indicate translates the zonal recommendations of the draft SSEP Pathways into discrete projects which can be planned for in the CSNP.

- Pathways outline potential offshore wind and interconnector capacities at national and zonal levels,
- With limited time before Pathway selection, designs will prioritise strategic and spatial coordination principles,
- High level electrical coordination opportunities will be considered but not included in these indicative designs. Detailed consideration will occur in the *Design* phase.

Question: Would it be helpful to see the indicative offshore designs before the system requirements publication?



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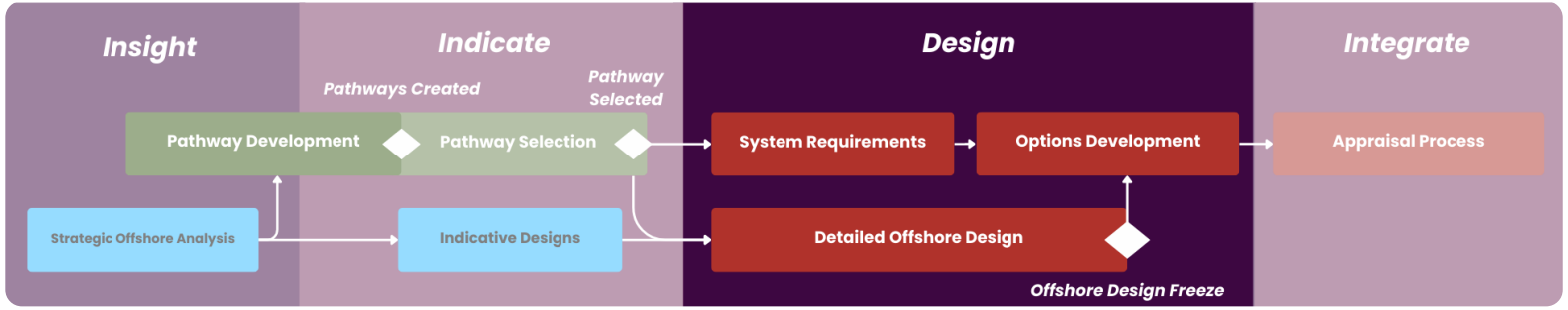
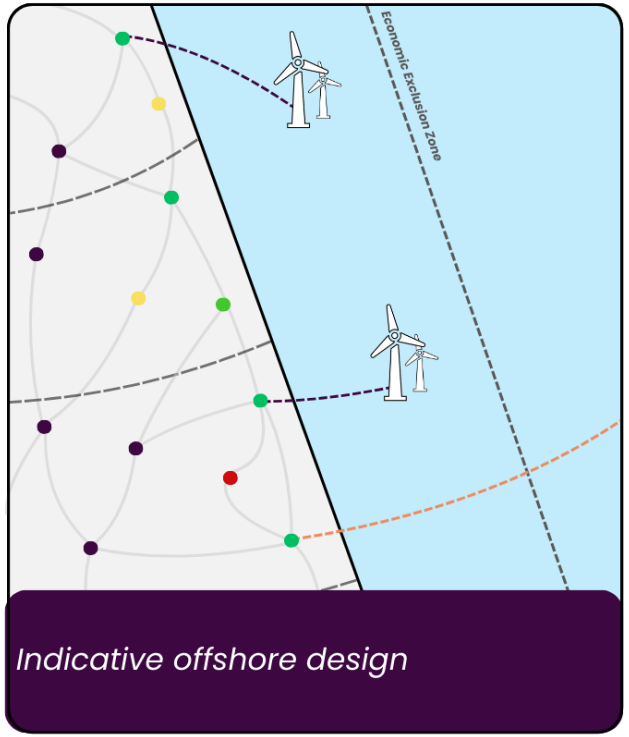
Stage 3: Design

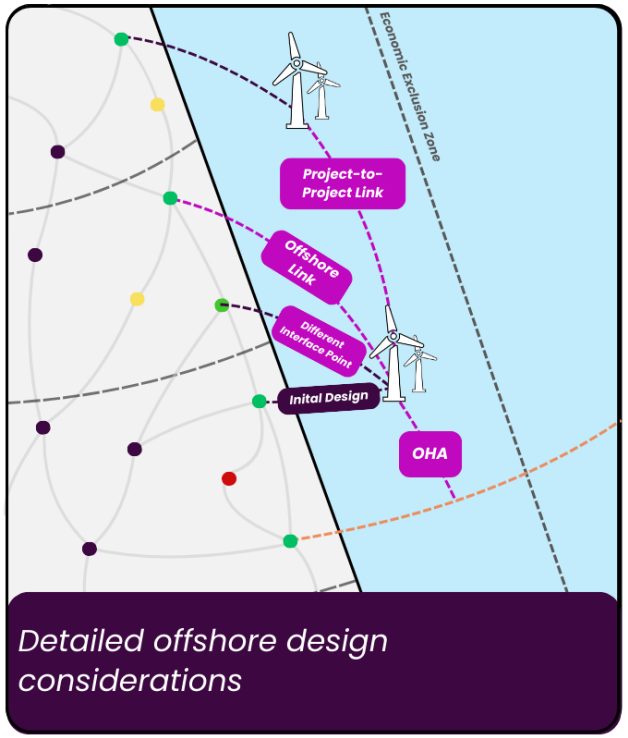


The *Design* phase covers a new stage of the CSNP – Detailed Offshore Design. This will occur in parallel to other elements of the CSNP.

- This explores opportunities for electrical coordination, including for the first time multi-purpose interconnectors,
- We will invite third-party feedback on the initial designs from the *Indicate* stage and consider third party designs in the *Design* stage,
- An offshore design freeze provides certainty for longer term onshore option development allowing for a complimentary and holistic appraisal



Indicative offshore design



Detailed offshore design considerations

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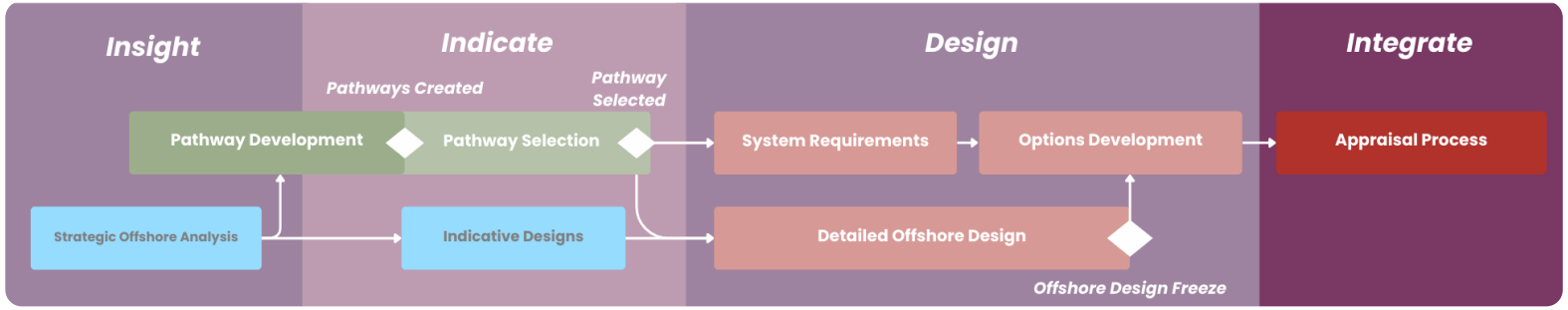
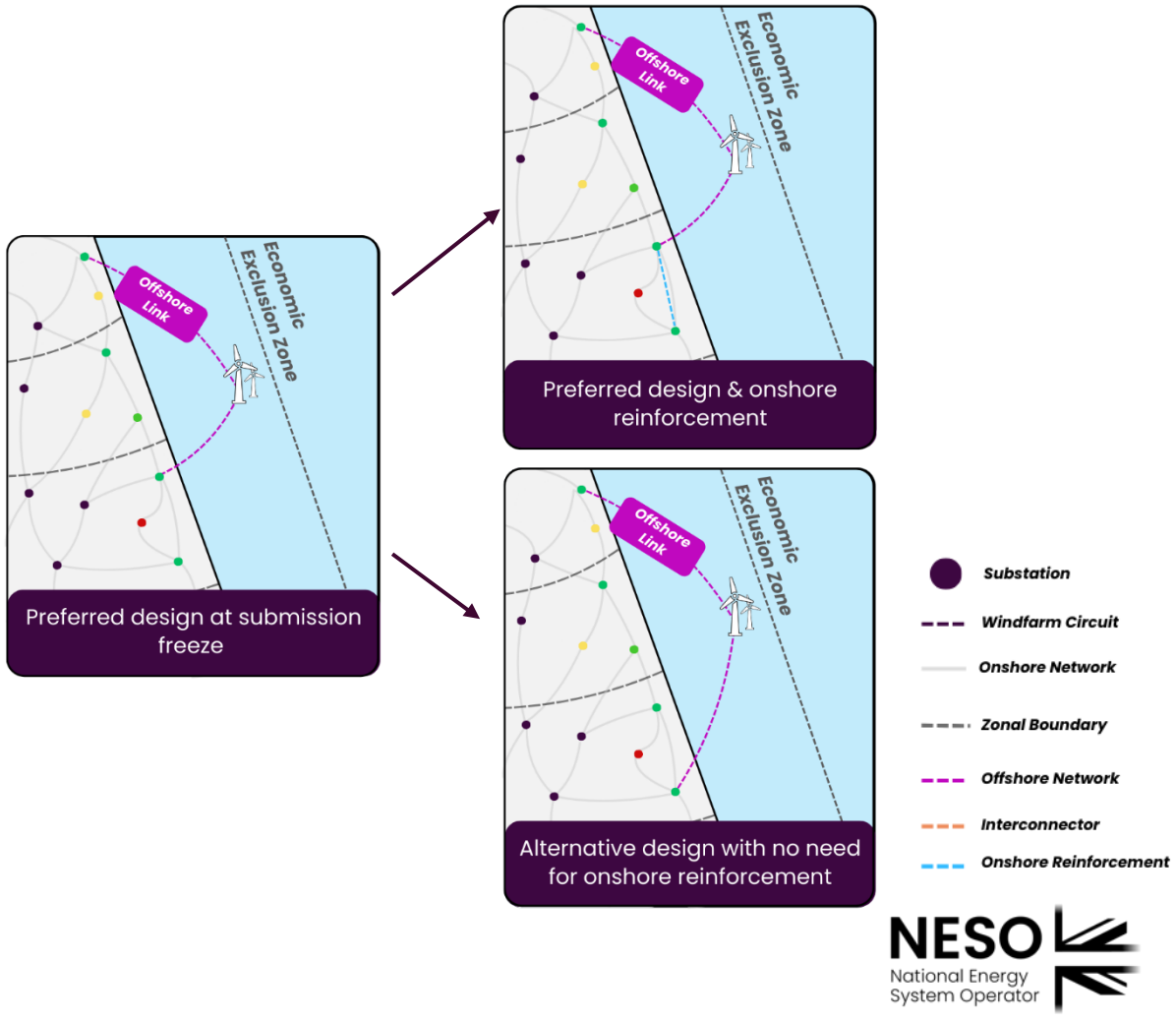
Stage 4: Integrate



The *Integrate* phase focuses on bringing onshore and offshore options together as part of the CSNP appraisal.

- By implementing the design freeze, the necessary combination of onshore and offshore studies can occur,
- The Appraisal process determines the best performing combination of options (onshore or offshore) against a consistent and holistic assessment criteria,
- CSNP recommends the best performing combination to provide the final (offshore and onshore) network design,
- These recommendations will inform future processes providing a clear link between the SSEP, CSNP and future delivery.



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Immediate next steps

Come along to our technical webinars to learn more about the specific aspects to the proposals.

Hydrogen planning	24 July	2pm

Previous webinars are available to watch on NESO's website

Strategic energy planning (SEP) publications, consultations and updates | National Energy System Operator

Leave us consultation feedback through our CSNP surveys:

- Whole system network planning
- Electricity network planning
- Gas network planning
- Hydrogen network planning

Consultation closes
1 August 2025

→

Final methodology
30 September

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Q&A

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