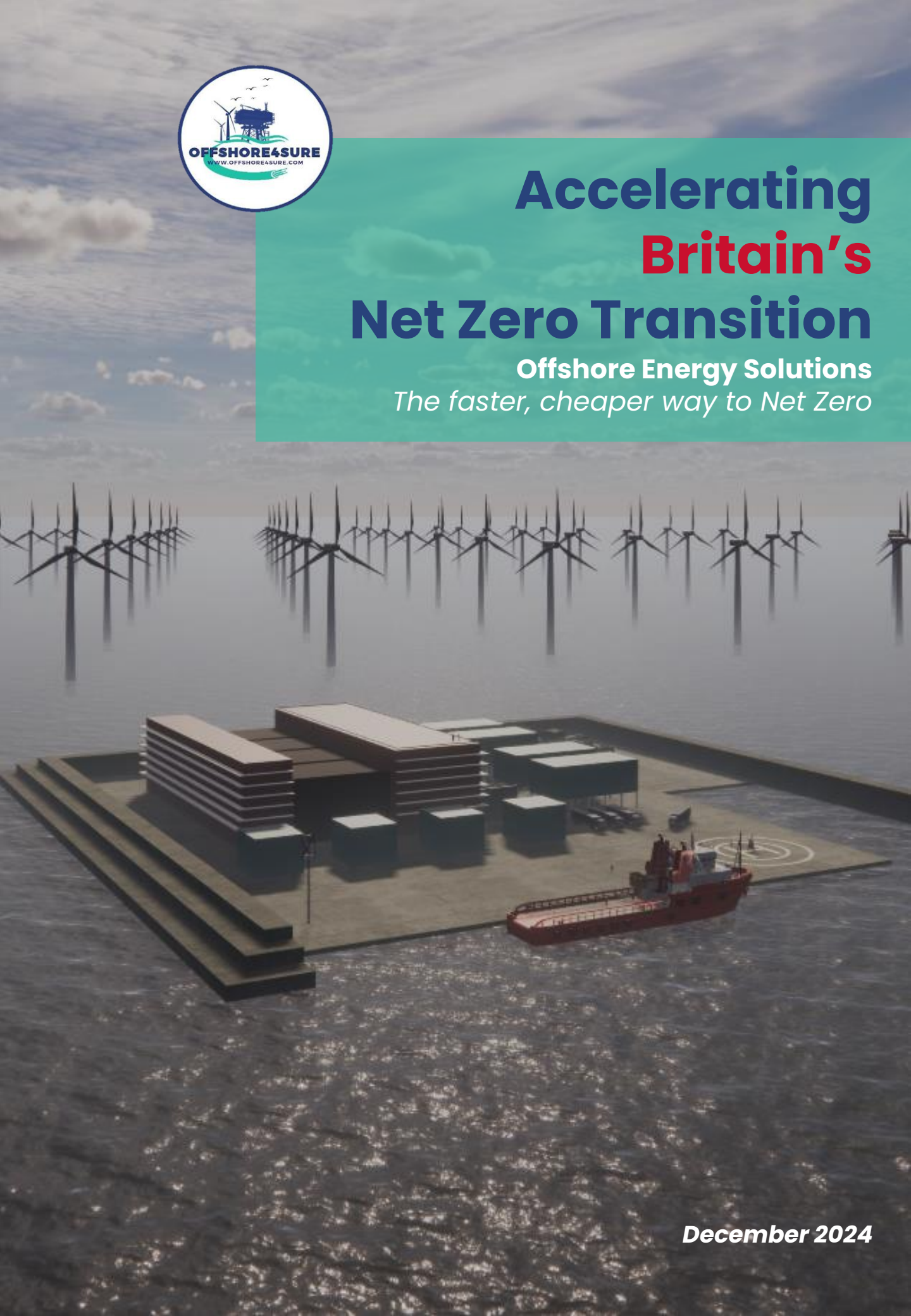

Accelerating Britain's Net Zero Transition

Offshore Energy Solutions

The faster, cheaper way to Net Zero

December 2024

Accelerating Britain's Net Zero Transition
Offshore Energy Solutions

Suffolk Energy Action Solutions (SEAS) formed in 2019, is now part of Offshore4sure. We are a group of like-minded organisations around the country, connected by our shared belief that using brownfield sites for energy hubs and pooling and transporting wind energy offshore, to connect to the onshore grid closer to demand, offers **Faster**, **Cheaper** and **Better** long-term solutions for consumers and Britain. We are highlighting and promoting the network design principles adopted by all other leading European wind power nations.

We are a pro-green energy development group, we are well-informed, expert-advised and solution-focussed, pushing for better long term transmission network designs for Britain and all consumers.

Why Faster: Using brownfield sites for onshore infrastructure and transporting energy offshore closer to demand to connect to the grid, means fewer planning issues, swifter community buy-in, and thus a shorter planning cycle.

Why Cheaper: Pooling wind energy and integrating infrastructure offshore significantly reduces the need for onshore infrastructure, cutting the required amount by approximately half and leading to substantial capital expenditure savings (Capex saving[1]). Transporting energy offshore directly from windfarms closer to where it is needed before connecting to the grid, results in much lower grid constraint costs. This achieves these constraint cost savings, without having to build more infrastructure specifically for this purpose at significant cost and higher bills for consumers (e.g. Sea Link a proposed 2 GW high-voltage direct current subsea cable designed to reinforce the UK's electricity transmission network between Suffolk and Kent). This is about optimising overall system cost-benefits in the medium to long term, including the holistic costs of the cumulative impact of these projects on community health, environmental/biodiversity loss and local economic impact.

Why Better: The vastly reduced onshore infrastructure footprint (<50%) means a significantly reduced negative impact on communities, the environment/biodiversity and local economies (c. £1bn over 12 years[22]). The right spatial plan using brownfield sites and reduced onshore infrastructure will allow for the accelerated wind energy capacity development the Government seeks, whilst maintaining greater community buy-in and goodwill. A meshed offshore grid network design offers greater flexibility and security/resilience than current plans (see below).

The current plans are outdated, and they do not consider the cumulative impact of onshoring individual projects in rural East Anglia. As such, a holistic network design analysis including East Anglia is required[3]. This analysis must look at taking the energy that is currently destined for Suffolk's coast to brownfield sites closer to demand.

Ofgem's recent decision to send Nautilus back to Isle of Grain (a planned 1.4 GW Offshore Hybrid Asset connecting offshore wind farms to both the UK and Belgium via subsea cables, with UK landfall proposed for the Isle of Grain in Kent) based on overall value for money, should also be replicated for EA1N and EA2. This would mean energy being sent to an existing brownfield substation hub site closer to London and the South East[4]. More time can then be taken to plan for other projects such as LionLink (1.8 GW subsea interconnector between the UK and the Netherlands aiming to enhance energy security and integrate renewable energy sources) to become part of a future meshed offshore grid (see below).

How to achieve Government's and NESO's goals:

The newly created NESO has three priority objectives as outlined in the Energy Act 2023:

1. The net zero objective.
2. The security of supply objective.
3. The efficiency and economy objective.

Our solution and network **design principles** are fully aligned to help deliver on the Government's goals:

1. Refurbish and upgrade onshore infrastructure to optimise capacity in keeping with National Policy Statements.
2. Use existing brownfield sites first for onshore infrastructure for offshore wind.
3. Pool offshore wind farm power offshore.
4. Route power offshore closer to the centres of demand.

[1] ESO's 'Offshore Coordination Phase 1 Final Report'.
[2] The Energy Coast Report 2019 (Max Clapham: Research Director, BVA-BDRC)
[3] East Anglia was carved out of ESO's 2022 Holistic Network Design Report recommendations.
[4] SEAS Response to Ofgem's 'Development of an Economic Evaluation Strategy' consultation.

To achieve NESO's objectives, we need to use these principles to work towards a **meshed offshore grid** (MOG) as part of Britain's offshore and onshore electricity grid network. This HVDC MOG[5] can transform the cost efficiencies and speed of deployment that is currently being sought.

We are aware that NESO are working on three key publications: a Strategic Spatial Energy Plan; a Future Energy Pathways report; and a Centralised Strategic Network Plan. Our design principles and a MOG should be at the heart of the NESO's thinking from day one, designing the Great British Offshore Grid (involving GBE), it is an idea consistent with the need to transform our infrastructure from the 20th to 21st Century. All other leading European wind power nations are adopting this approach, and we are in danger of missing out on the benefits our neighbours will enjoy.

Faster and Safer to Net Zero:

- A meshed offshore grid maximises offshore wind integration, and pooling multiple wind farms reduces the need for individual grid connections.
- Using brownfield sites for onshore infrastructure and more strategic routing of energy offshore closer to demand, means fewer planning issues, swifter community buy-in and shorter planning cycles.

Increased Security and Flexibility:

- A MOG connects multiple offshore wind farms and interconnectors to several onshore points, creating a network with many pathways for electricity to flow. If one part of the grid fails or is sabotaged, power can be rerouted through other connections, reducing risk of outages, making it more resilient to technical issues, weather variations and terrorism.
- Using several brownfield sites closer to demand (and therefore likely better protected) will ensure that over 30% of Britain's wind energy is not landing in coastal Suffolk.
- The MOG design improves flexibility allowing better dynamic load balancing and power flow optimisation, adjusting for variations in electricity generation and demand, ensuring power is distributed efficiently and with a continuous supply.
- MOGs allow new wind farms to connect more efficiently when ready, using existing infrastructure, not requiring new infrastructure for each project, with this streamlined integration allowing more efficient wind power capacity growth.

More Efficient and Economic:

- A MOG is cheaper for consumers in the medium to long term. National Grid ESO's reports have consistently shown significant overall transmission network cost savings from greater and faster offshore coordination, e.g. a c.£2 billion saving[6] for East Anglia alone with greater offshore integration, due to the sharing of infrastructure resulting from pooling wind farm energy offshore.
- Taking power offshore closer to demand before connecting to the onshore AC grid also significantly reduces constraint costs and can also reduce the need for and costs of infrastructure required to achieve the same result (e.g. Sea Link c.£1.8bn).
- Utilising brownfield sites for onshore infrastructure would offer significant economic benefits by driving the regeneration of pre-industrialised areas.

Better for the Environment and Communities:

- A significantly reduced onshore infrastructure footprint plus brownfield sites for Energy Hubs, results in greatly reduced negative impact on the environment/biodiversity loss, communities and local economies.

Summary:

- By adopting a strategic approach focused on using brownfield sites, integrating offshore wind infrastructure, and prioritising a meshed offshore grid design, Britain can achieve Net Zero faster, more cost-effectively, and with greater community support. This approach minimises environmental and social impacts, reduces costs for consumers, and ensures a resilient and efficient energy network that meets future demands. Adopting these solutions would position Britain, much like our European neighbours, as a leader in sustainable energy development, whilst delivering long term benefits for local communities and the nation.

[5] DNV Report - Multi -terminal HVDC Grid: Current status and next steps
[6] >£2bn cost savings for greater offshore integration for East Anglia alone - ESO's 'Offshore Coordination Phase 1 Final Report', Page 29 (East Anglia labelled as Eastern Regions).