PROJECT BRITANNIA

Repurposing North Sea Platforms for Offshore Hydrogen Production

White Paper **Full UK Industrial Edition** Based on Version 1.1 (Updated 2026) 2026

A Just Transition for Coastal Communities. A British-built energy strategy for Britain.

> **UK-first principle (procurement-safe):** Britannia is written to make the case that the UK can build, operate, and benefit from this infrastructure using British skills and a British supply chain. Any vendor examples below are illustrative only; selection is for HM Government and delivery partners.

Executive Summary

Project Britannia proposes to repurpose selected end-of-life North Sea oil and gas platforms already facing expensive decommissioning into offshore hydrogen production hubs powered by UK-designed Small Modular Reactors (SMRs), with Rolls-Royce as a leading UK example already in the national SMR programme.

24bn	470	Thousands
UK taxpayer exposure in decommissioning tax relief (indicative, per NSTA-cited estimates)	End-of-life platforms in UK waters (indicative public figure used across Britannia materials)	Skilled offshore jobs at risk if capability is dismantled rather than repurposed

Britannia addresses three national priorities at once: reducing decommissioning burden, strengthening energy security with reliable low-carbon hydrogen, and delivering a just transition that keeps British workers in British jobs not only on the platforms, but across the UK fabrication, manufacturing, logistics, ports, and maintenance supply chain.

> *"I watched my friends lose everything when the pits closed in the 1980s. I won't stand by and watch the same thing happen to offshore workers. We have the platforms, we have the skills, and we have the technology."*
>
> ***Dave Waugh, retired engineer and Project Britannia originator***

Core architecture: a distributed 1+4 layout placing one reactor platform separated 2 5 km from four hydrogen production platforms. Each cluster targets order-of-magnitude output of **40,000 50,000 tonnes of hydrogen annually**, with valuable co-products and a design philosophy of zero-to-minimum routine discharge.

Timeline (indicative): Phase 1 (2025 2027) regulatory pathways and feasibility; Phase 2 (2028 2032) first demonstration; Phase 3 (2032+) fleet-scale deployment.

Contents

1. Introduction & Problem Statement

The UK North Sea sector is entering an end-of-life phase. Production has fallen significantly since peak output, and decommissioning is accelerating. Under current arrangements, the UK faces large, multi-decade costs to remove assets that still have structural integrity and strategic value in a clean-energy system.

The North Sea is more than steel. It is a national capability   offshore operations, safety culture, marine logistics, inspection regimes, and a workforce that can run complex infrastructure in harsh conditions. If we dismantle that capability by default, we do not just lose jobs; we surrender industrial sovereignty.

> **Britannia   the patriotic case:** Repurpose what Britain already built. Keep British workers earning, training, and progressing. Keep procurement, fabrication, maintenance, and innovation anchored in the UK.

2. Project Architecture & Technical Basis

Britannia uses a distributed 1+4 configuration:

- **One reactor platform:** hosting a UK-designed SMR (Rolls-Royce as a leading UK example) providing baseload electricity.
- **Four hydrogen production platforms:** housing electrolysers, desalination, gas separation, compression, and export systems, located ~2   5 km from the reactor platform.

Safety by separation reduces cascade risk and supports practical offshore safety zoning and emergency response planning.

Hydrogen process (high level):

1. Seawater desalination (reverse osmosis or thermal)   freshwater + brine.
2. Electrolysis (PEM/alkaline)   hydrogen + oxygen using SMR electricity.
3. Purification, compression, and export via pipeline/shipping interface.

4. Co-product capture and circular processing (oxygen, brine streams, waste heat).

Order-of-magnitude output per cluster: 40,000 50,000 tonnes Hb2/year and ~350,000 tonnes Ob2/year (indicative values carried from the original Britannia materials).

UK manufacturers and suppliers indicative examples

Unit / System	UK examples (illustrative, non-exhaustive)	Notes (procurement-safe)
SMR (electricity source)	Rolls-Royce SMR	Referenced as a leading UK example in existing Britannia documents; final design and deployment subject to national programme decisions and regulatory approvals.
Electrolysers (PEM/other)	ITM Power; Bramble Energy; Clean Power Hydrogen (CPH2)	Illustrative UK firms in hydrogen equipment/technology; vendor selection to be made by Government and delivery partners.
Desalination / RO + water treatment	Salt Separation Services (SaltSep); Solar Water Plc; Nijhuis Industries (UK operations)	Illustrative UK-based capability for offshore/industrial water treatment and desalination support.
Brine / mineral recovery pathway (optional)	Evove; Northern Lithium; Cornish Lithium	Examples linked to DLE and brine/ mineral work; this is a future-option pathway and should be treated as upside, not a base-case revenue assumption.
Offshore engineering, conversion, EPC	Wood; Petrofac; Kent	Examples of UK-headquartered / UK-major operators with North Sea delivery experience.

Disclaimer: The above are illustrative examples of UK capability and are not endorsements, partnerships, or procurement recommendations by Project Britannia.

Technology readiness (indicative)

Component	TRL	Notes
Small Modular Reactors (UK-designed example: Rolls-Royce)	6 7	Design approval process underway; first units expected late 2020s (indicative).
Electrolysis (PEM/Alkaline)	8 9	

Component	TRL	Notes
		Commercially available; offshore adaptation and integration required.
Desalination (RO/thermal)	9	Mature; widely deployed offshore/industrial.
Platform repurposing	5 6	Precedents exist; detailed engineering and integrity assessments required.

3. Target Regions & Industrial Integration

Teesside: Existing hydrogen infrastructure and industrial demand (chemicals, steel). Britannia clusters could feed hydrogen into emerging networks supporting industrial decarbonisation.

Humberside: Major industrial cluster with port infrastructure and potential integration with wider clean-energy projects.

Aberdeen: Offshore supply chain hub and engineering powerhouse; a natural centre for conversion work, operations, and training.

Pipeline & export: Many platforms have pipeline connectivity. Options include pipeline repurposing subject to integrity assessment and embrittlement mitigations, new hydrogen pipelines, or shipping vectors (liquid hydrogen/ammonia) where required.

4. Safety & Risk Management

Safety by design includes passive safety concepts for SMRs, offshore isolation from population centres, and distributed layout separation to reduce cascading risk.

- **Regulatory uncertainty:** offshore nuclear-hydrogen integration frameworks are not yet established.
- **Public acceptance:** requires transparent engagement and credible safety cases.
- **Structural integrity:** not all platforms are candidates; surveys and fatigue/ corrosion assessment required.
- **Timeline risk:** SMR deployment schedules may shift; a phased plan reduces downside.

5. Hydrogen Export & Market Integration

UK hydrogen demand projections are significant by mid-century, driven by heavy industry, transport, storage, and power-system balancing. Britannia aims to provide reliable domestic low-carbon hydrogen at industrial scale, reducing import exposure.

Export pathways may include North Sea interconnectors and shipping vectors, subject to market development and infrastructure decisions.

Indicative economics in the original Britannia materials place pink hydrogen in a competitive band versus blue and increasingly versus green, with outcomes dependent on capital costs, conversion scope, capacity factors, and policy mechanisms.

6. Circular Economy & Waste Valorisation

Design philosophy: zero-to-minimum routine discharge. Every output stream should be treated as a value stream where feasible.

- **Oxygen:** saleable co-product for industrial/medical/aquaculture markets (market-dependent).
- **Brine:** potential conversion into de-icing agents and chemical feedstocks where environmentally and economically justified.
- **Lithium extraction:** emerging technology; treated as conceptual upside rather than a core assumption.
- **Waste heat:** utilised for thermal desalination and process efficiency improvements.

7. Workforce & Just Transition

Britannia is designed around British people. The goal is a just transition that protects coastal communities and retains offshore excellence as a national asset.

The Skills Passport concept recognises existing offshore competencies and adds targeted upskilling modules (hydrogen safety, electrolyser operations, nuclear safety culture, circular processes). Delivery partners could include unions, industry bodies, and regional colleges.

Scaling to multiple clusters preserves direct offshore jobs and supports larger UK supply-chain employment in fabrication yards, ports, inspection, logistics, engineering services, and operations control.

8. Delivery Roadmap & Regulatory Pathway

Phase 1 (2025 2027): regulatory pathway development, independent feasibility and safety studies, platform surveys, stakeholder engagement, Skills Passport pilot.

Phase 2 (2028 2032): first demonstration 1+4 cluster engineering, installation, commissioning, trials, safety validation.

Phase 3 (2032+): fleet-scale rollout across suitable UK platforms, infrastructure expansion, workforce scaling. Indicative target carried from original materials: 10 20 clusters by 2040.

9. Annex: Terminology & Data Sources

Platforms vs installations vs rigs: Platforms are fixed/floating structures supporting production/processing/accommodation; installations can include subsea structures; rigs are mobile drilling units and are not candidates for repurposing as production hubs.

Counts and costs: Public figures used in Britannia materials are indicative; precise counts vary by dataset and definitions. Decommissioning costs and taxpayer exposure figures are stated as NSTA-cited estimates within the original Britannia documents.

Author disclaimer: This paper is based on publicly available data, independent research, and technical estimates. Figures are indicative and subject to engineering review, regulatory assessment, and stakeholder consultation. Project Britannia is not affiliated with any government body or commercial entity.