FUTURE PORT INFRASTRUCTURE
CLEAN TYNE BLUEPRINT

FULL SHORE POWER
Fully electric supply to reduce ship berth emissions at port.

INTEGRATED OF ONSITE RENEWABLE ENERGY
Energy generation decoupled from a reliance on fossil fuels and a grid network supply to onsite renewably sourced energy.

ELECTRIC VEHICLE CHARGING
Integrated services for electric vehicles (EV) charging including on-site electrical infrastructure and controls.

ENERGY STORAGE
Integrated storage technologies used to balance energy supply and demand, and provide flexibility to reduce emissions, costs, and stress on infrastructure.

ASSET HEALTH MANAGEMENT
Integrated sensors with real-time data feeds that enable optimised performance and the ongoing condition assessment of assets.

ELECTRIC POWER CARGO HANDLING EQUIPMENT
Electric powered cargo handling equipment (CHE) to eliminate exhaust emissions from diesel, gas, or propane plant.

INTELLIGENT CONTROL
Smart and stand-alone micro-grids with integrated renewable energy systems, intelligent control of switchgear, energy storage and electric equipment demand management.
PROJECT OVERVIEW
CLEAN TYNE BLUEPRINT

BACKGROUND
The International Maritime Organisation (IMO) has set a global 2050 target to reduce shipping emissions by 50% compared to 2008 levels. This will require holistic decarbonisation and presents a huge opportunity for the UK to build on the strength of its maritime sector to become a centre of excellence in clean shipping. Digital applications are one of the core enablers for future low-carbon ports and could allow operators to access an estimated economic contribution of $650-890 million per year attributed to the sector’s decarbonisation. However, digitalisation of port operations will see radically new ways of working that will require successful case studies.

The Port of Tyne is an ideal organisation to become a clean port exemplar – handling cargo from 5 continents and boasting leading-edge facilities on the River Tyne in North East England, served by a network of sea routes, major roads and railways. As one of the UK’s most innovative and efficient deep-sea ports, they have developed a decarbonisation roadmap, with an ambition to electrify the entire port by 2040. The site has significant renewable energy generation potential, with 75 hectares of accessible land — including Tyne Dock, Royal Quays Enterprise Park, Howdon and Morston, and North Bank. The port is also already working on an asset electrification programme, involving the transformation of legacy material handling assets from diesel to low-carbon electricity.

TRANSITION ROADMAP
To support the decarbonisation transition, the Clean Tyne project set out to define cleaner, sustainable and more effective operations, and to inspire a change of mindset in the maritime industry.

Clean Tyne consortium partners have identified a timeline of interventions required to achieve a digitalised and decarbonised Port of Tyne – The Transition Roadmap. This roadmap is applicable to ports across the UK and identifies practical actions required across four key intervention streams. Namely,

- energy generation and asset electrification,
- business models,
- digital platform development, and
- infrastructure development.

If net-zero emissions are to be achieved these interventions must be delivered together, informing and interacting with each other as port operations develop. Whilst this roadmap sets out a possible timeline for implementing changes, we recognise that this requires port authorities to take a proactive stance through improving circular economy synergies, investing in new infrastructure, and redeveloping existing port areas to support new services.

CONSORTIUM PARTNERS
Hover over the partner logos to find out more
DIGITALISED AND DECARBONISED PORT TRANSITION ROADMAP

<table>
<thead>
<tr>
<th>Energy Generation and Asset Electrification</th>
<th>Business as Usual</th>
<th>Initial Key Energy Asset Electrification</th>
<th>Total Key Energy Asset Electrification, Renewable Energy Sources and Storage Introduced</th>
<th>Total Electrification of All Energy Assets</th>
</tr>
</thead>
</table>

- **present 2022**
- **immediate 2023-25**
- **short term 2026-30**
- **medium term 2031-40**
- **long term 2041-50**

**Digitalised and Decarbonised Port Transition Roadmap**

- This Digitalised and Decarbonised Port Transition Roadmap helps define the technologies and processes port operators should consider in the short, medium and long term to enable cleaner, sustainable and more effective operations.
- Actions have been grouped into four key interventions streams (energy generation and asset electrification, business models, digital platform development, and infrastructure development).
- Hover over each action to see details and impacts.

**Current State / Basic Operation**

- **5-year Development Plan**
- **Network and Technology Implementation Strategy**
- **Port Asset Improvements**
- **Energy Networks Working Group**
- **Major Infrastructure-Project Delivery**
- **Innovative Energy Assets Delivery**
- **Enhancing Port Flexibility**

**Digitalisation and Decarbonisation Port Transition Roadmap**

- Energy cost and emission reduction without coordination of energy assets
- Energy cost and emission reduction with coordination of energy assets