

# DIGITALISED AND DECARBONISED PORT TRANSITION ROADMAP

CLEAN TYNE BLUEPRINT

APRIL 2022



**SIEMENS**



LET'S GET STARTED

# FUTURE PORT INFRASTRUCTURE

## CLEAN TYNE BLUEPRINT

### INTELLIGENT CONTROL

Smart and stand-alone micro-grids with integrated renewable energy systems, intelligent control of switchgear, energy storage and electric equipment demand management.

### ENERGY STORAGE

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

### ELECTRIC VEHICLE CHARGING

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

### FULL SHORE POWER

Fully electric supply to reduce ship berth emissions at port.

### ASSET HEALTH MANAGEMENT

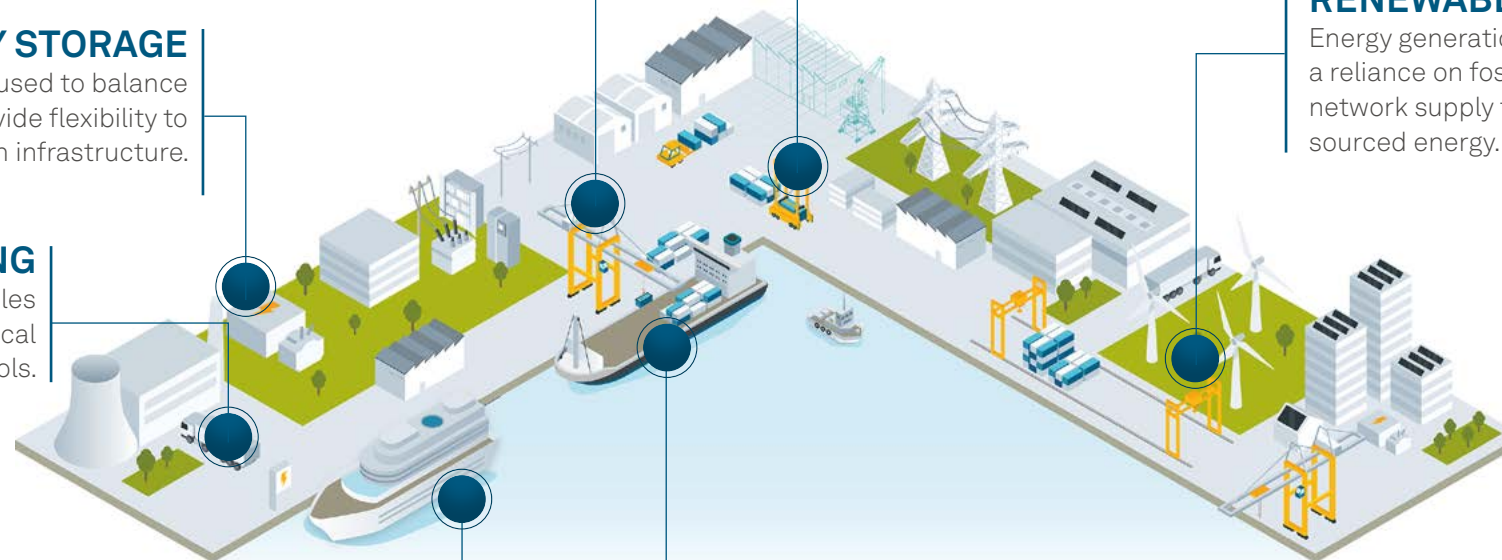
Integrated sensors with real-time data feeds that enable optimised performance and the ongoing condition assessment of assets.

### INTEGRATED OF ONSITE RENEWABLE ENERGY

Energy generation decoupled from a reliance on fossil fuels and a grid network supply to onsite renewably sourced energy.

### ELECTRIFICATION OF CARGO HANDLING EQUIPMENT

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



# PROJECT OVERVIEW

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### 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 sectors 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



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CURRENT STATE / BASIC OPERATION

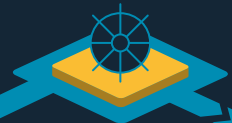
present  
2022

immediate  
2023-25

short term  
2026-30

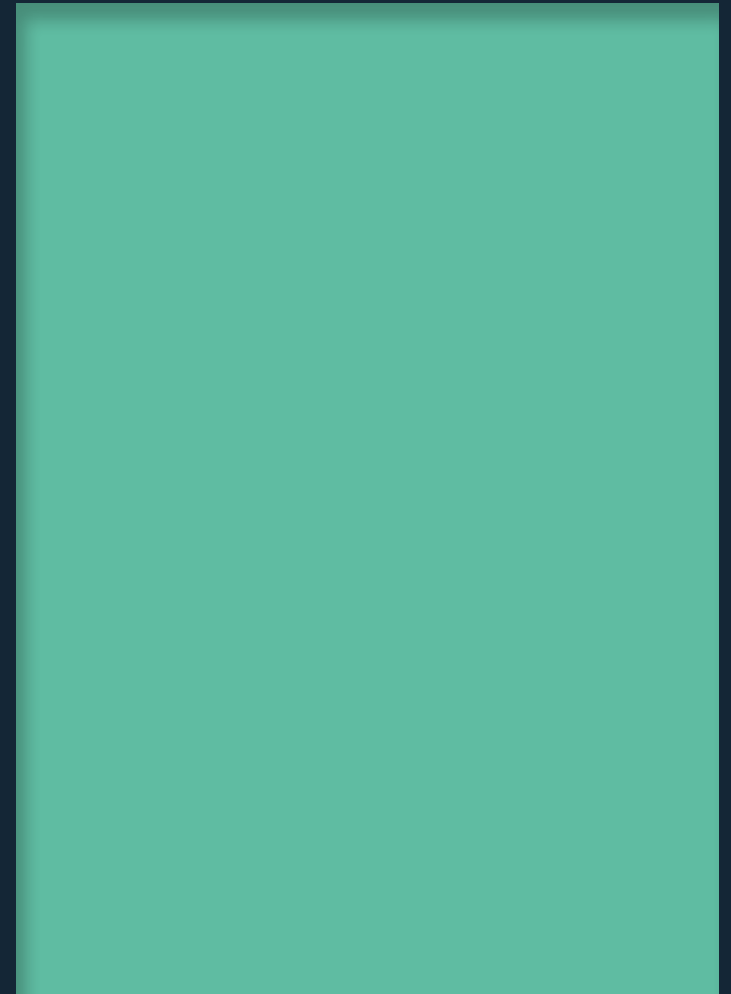
medium term  
2031-40

long term  
2041-50



Energy cost and emission reduction without coordination of energy assets

Energy cost and emission reduction with coordination of energy assets



DIGITALISED AND DECARBONISED PORT TRANSITION ROADMAP

### **PORT OF TYNE**

Website: <https://www.portoftyne.co.uk/>

Twitter: [https://twitter.com/Port\\_of\\_Tyne](https://twitter.com/Port_of_Tyne)

LinkedIn: <https://www.linkedin.com/company/port-of-tyne>

### **NORTH**

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### **NEWCASTLE UNIVERSITY**

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### **SIEMENS**

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### **CONNECTED PLACES CATAPULT**

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