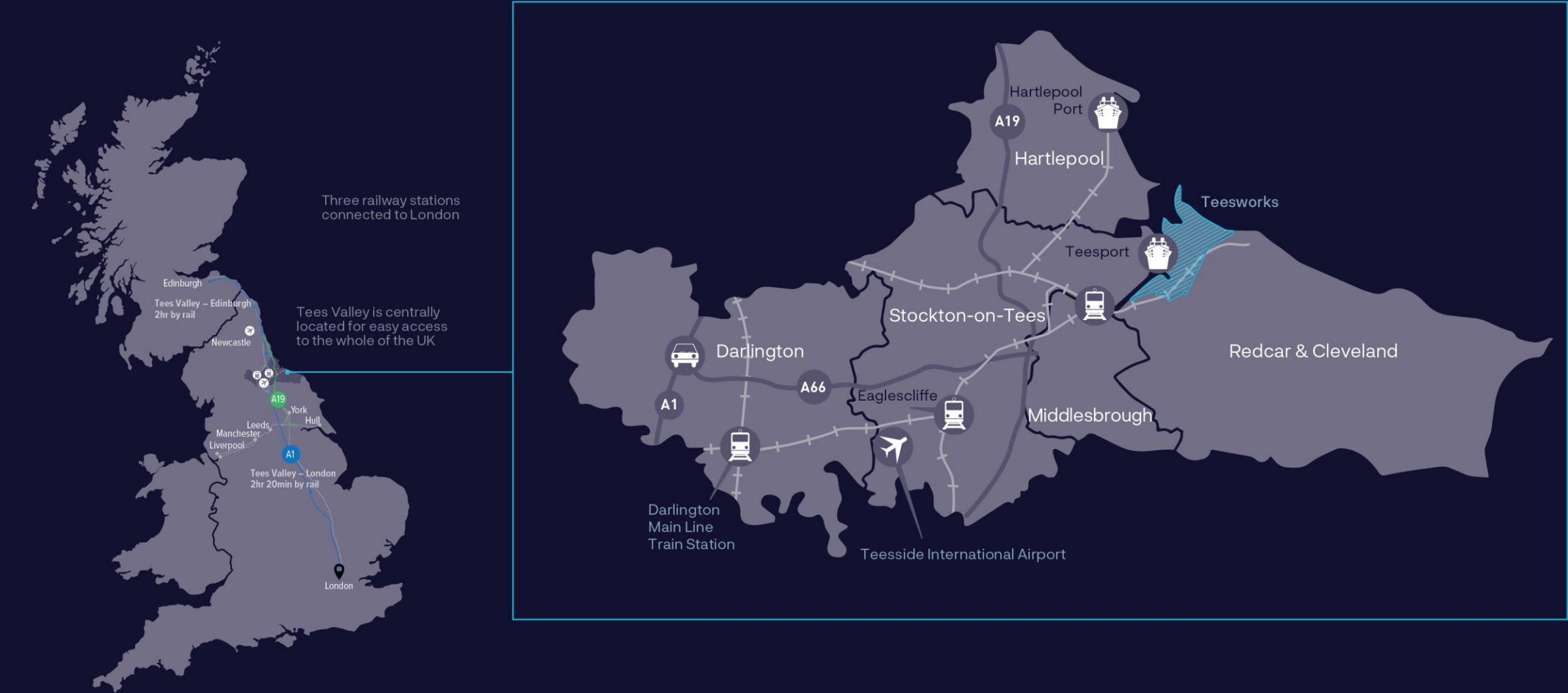


# TEES VALLEY COMBINED AUTHORITY

Chris Beck | Group Director of Clean Growth and Innovation

# LOCATION



# TEES VALLEY – THE PLACE



Population of 700,000 with 2.5 million people located within an hour's drive



The area is served by three airports, Teesside International, Newcastle and Manchester



The East Coast Main Line at Darlington enables a 2hr 20min journey to central London



Home to the deepest port on the east coast of England



Home to the Government's new Northern Economic Campus



£588.2m 10 year Investment Plan agreed

£74.6m on airport development programme



Situated within 1hr of six key universities including; Teesside, Durham, Newcastle and Leeds

Devolved skills budget focused on business needs



70% of regional businesses are internationally owned



Fast-growing economy worth £13.1bn



One of only ten Metro Mayors in the UK – devolution powers as London, Manchester and Liverpool

# 10-POINT PLAN FOR GREEN INDUSTRIAL REVOLUTION (NOV 20)

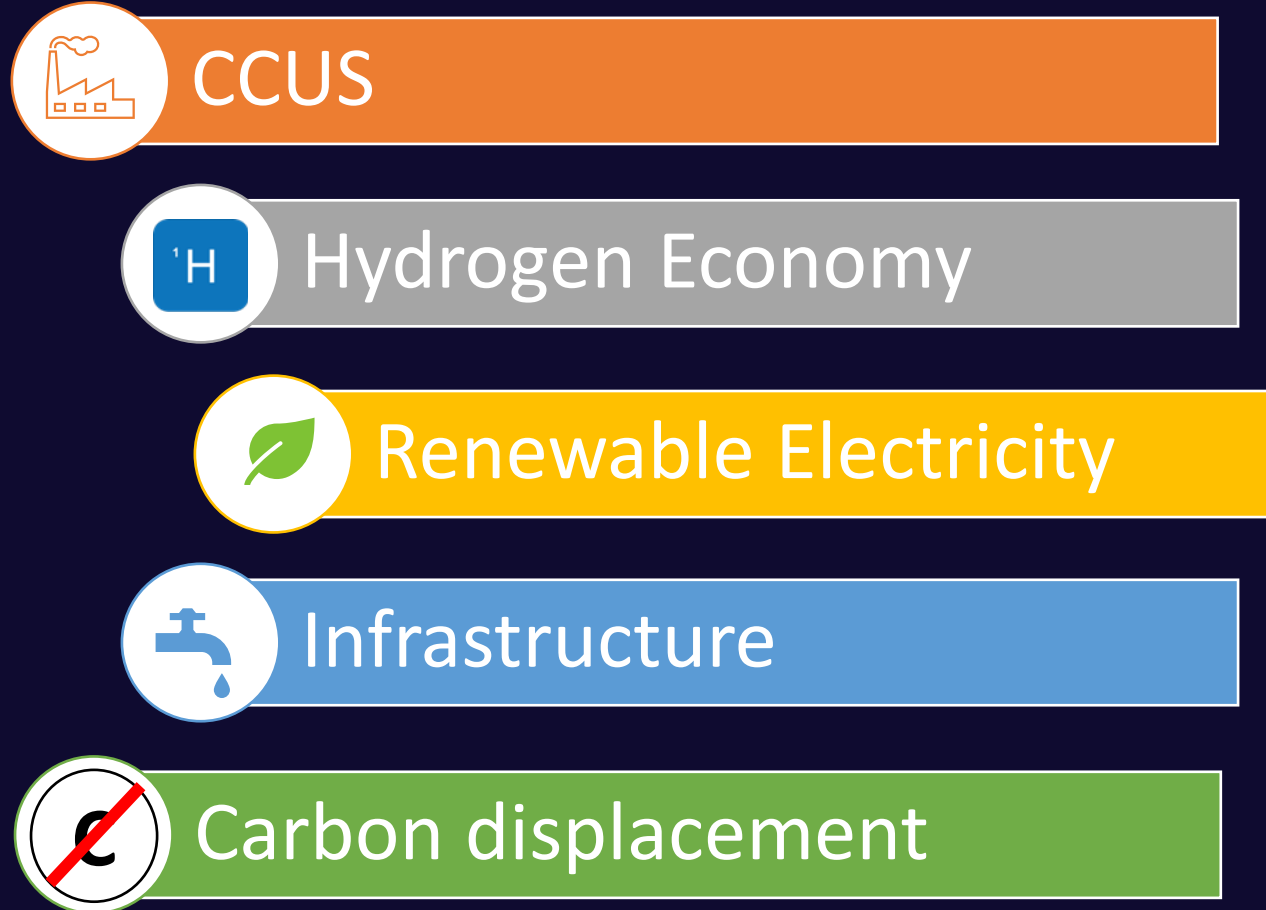
- Generation of 40GW of energy from offshore wind by 2030
- Production of 5GW of low carbon hydrogen by 2030
- Capture of up to 10Mt of carbon dioxide per year through the establishment of Carbon Capture Utilisation and Storage in two industrial clusters by mid 2020s, and four sites by 2030.
- Accelerating the shift to zero emission transport by ending the sale of new petrol and diesel cars and vans by 2030 and increasing the share of journeys taken by public transport, cycling and walking
- Making buildings more energy efficient and phasing out fossil fuel boilers, making people's homes warm and comfortable, whilst keeping bills low.
- Unleashing innovation to further develop green technologies for Net Zero



# UPDATE – UK ENERGY SECURITY STRATEGY (APRIL 22)

- Generation of ~~40GW~~ (50GW) of energy from offshore wind by 2030
- Production of ~~5GW~~ (10GW) of low carbon hydrogen by 2030
- Capture of up to 10Mt of carbon dioxide per year through the establishment of Carbon Capture Utilisation and Storage in two industrial clusters by mid 2020s, and four sites by 2030.
- Accelerating the shift to zero emission transport by ending the sale of new petrol and diesel cars and vans by 2030 and increasing the share of journeys taken by public transport, cycling and walking
- Making buildings more energy efficient and phasing out fossil fuel boilers, making people's homes warm and comfortable, whilst keeping bills low.
- Unleashing innovation to further develop green technologies for Net Zero
- “Significant acceleration” of nuclear power with a target of 24GW output by 2050 meeting 25% of overall power demand.

# HOW TO DECARBONISE

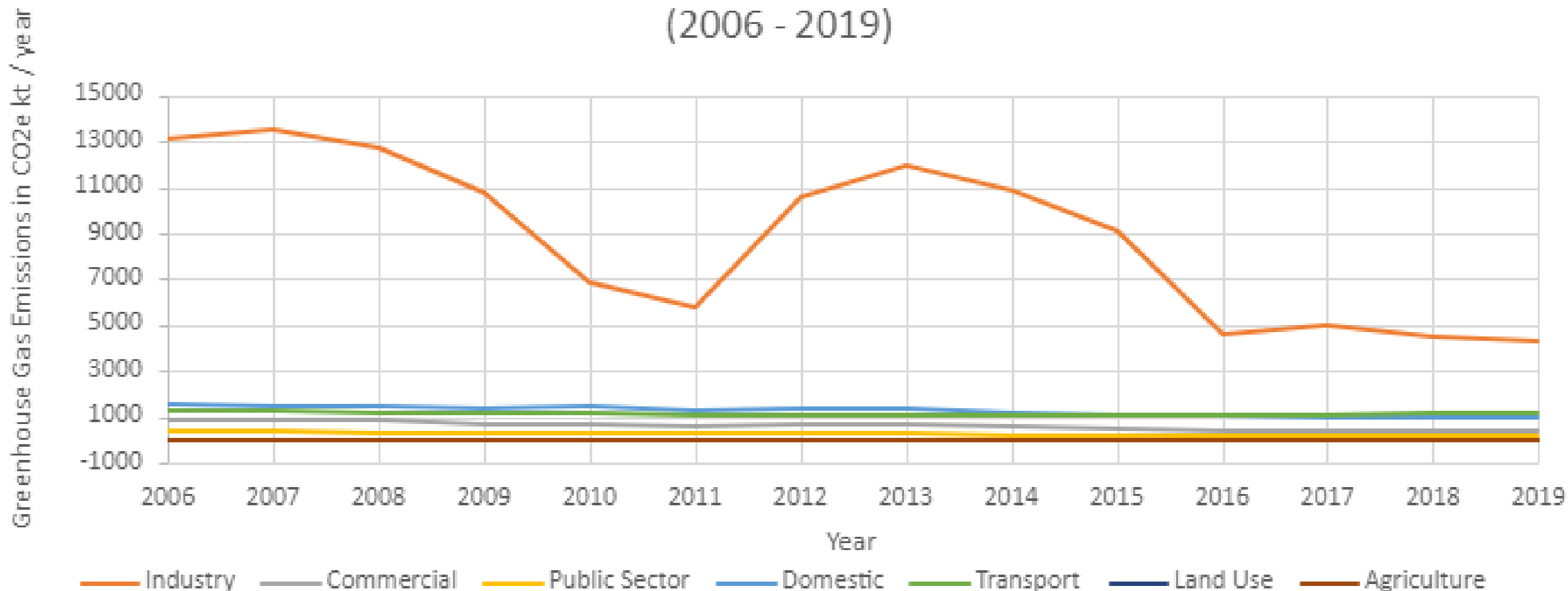


# TEES VALLEY CO<sub>2</sub> EMISSIONS 2019

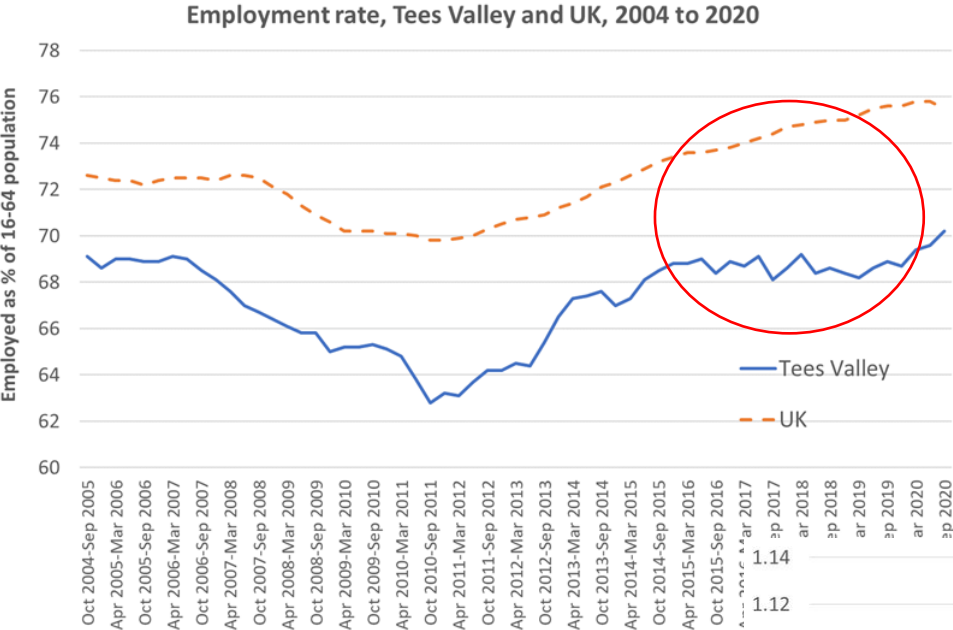
2019 emissions (kt CO <sub>2</sub> )	Tees Valley	UK	Tees Valley % Total	UK % Total	Tees Valley Per Capita Emissions (t)	UK Per Capita Emissions (t)
Household emissions	950	94,532	13.71%	27.44%	1.41	1.42
Industrial emissions	4327	82,913	62.42%	24.07%	6.40	1.24
Transport emissions	1168	124,303	16.85%	36.08%	1.73	1.86
Other Sector emissions (e.g. Agriculture and Commercial)	486	42,762	7.02%	12.41%	0.72	0.64
<b>Total Emissions</b>	<b>6,932</b>	<b>344,511</b>	<b>100%</b>	<b>100%</b>	<b>10.26</b>	<b>5.16</b>

# TEES VALLEY CO<sub>2</sub> EMISSIONS

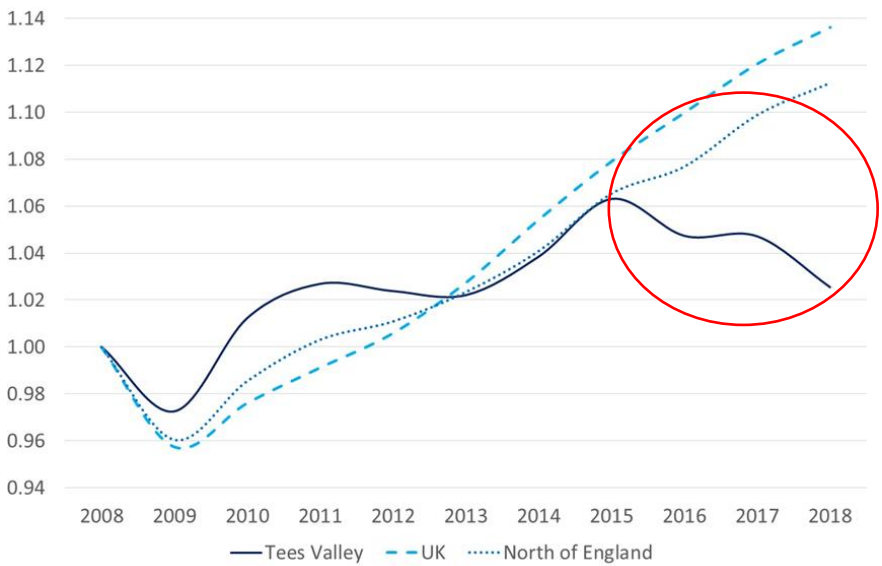
Tees Valley Emissions by Type of Emitter (Including Industry) in kt per year  
(2006 - 2019)



# SSI Closure 2015



GDP index





# WHY THE TEES VALLEY

- Proximity and ease of access to North Sea Storage
- Deepwater port for CO<sub>2</sub> / H<sub>2</sub> / NH<sub>3</sub> transport
- 5.6% of UK industrial emissions.
- History of decarbonisation planning > Teesside Collective
- Existing **pipe corridors** and infrastructure
- Operational H<sub>2</sub> storage & distribution.
- Import of 26% of UK's natural gas through CATS.
- Development Land





# Teesside Freeport





# ROUTE TO NET ZERO

- It is not just about emissions
- Also need to consider effect on current businesses
- Need to consider economic opportunities
- Need to create jobs



# ROUTE TO NET ZERO

- Net Zero Strategy – First draft Sept
- Five Pillars
  - Heavy Industry
  - Industry
  - Residential
  - Transport
  - Nature and Resources

*But we started 20 years ago!*





# CHEMICAL CLUSTER





## Key

- Existing Pipe Corridors
- Existing Tunnels
- Existing CO<sub>2</sub> Exports
- Ports

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Exwold Technologies  
Speciality Chemicals

Millfield  
Composites

EDF Energy  
Nuclear Power Station

ConocoPhillips  
Crude Oil Storage

Venator  
Tioxide

Seal Sands /  
North Tees  
Chemical Sites

ConocoPhillips  
Crude Oil Processing

Frutarom  
Flavours & Ingredients

Redcar Bulk Terminal  
Logistics

CATS  
Importer of Gas

Exolum  
Chemical Storage

Victrex  
BDF /  
Composites

Greenergy  
Biodiesel

Net Zero Teesside  
Power/CCS

PX  
Teesside Gas  
Processing Plant

Lianhetech  
Fine Chemicals

Navigator Terminals  
Chemical Storage

APS Growers  
Greenhouses  
Waste heat / CO<sub>2</sub> to grow tomatoes

SABIC  
Underground  
Chemical &  
Hydrogen Storage

Kemira  
Speciality Chemicals

Bran Sands  
Effluent Treatment

FUJIFILM Diosynth  
Bio Pharmaceuticals

Frutarom  
Flavours &  
Ingredients

Marlow  
Foods  
Quorn

KD Pharma  
Pharmaceuticals

BOC  
Air Separation  
Unit

British Steel  
Steel / Beams /  
Manufacturer

Nova Pangaea  
Technologies  
Biochemicals  
and Biofuels

SNF  
Speciality Chemicals

Johnson Matthey  
Catalyst

N&P Group  
Refuse Derived  
Fuel

BOC  
Air Separation  
Unit

Anglo American  
Mineral Processing

CF Industries  
Nitrogen Fertilisers

SITA  
Waste to  
Energy

Wilton Group  
Engineering

BOC  
Steam Methane  
Reformer

GE  
OSW

MGT  
Biomass Power

Huntsman  
Polyurethanes

SABIC  
Ethylene (Cracker)  
/ Polythene

Billingham  
Chemical Site

TWI  
The Welding Institute

Wilton Group  
Engineering

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp Biomass Power Station  
Power / Utilities

Huntsman  
Polyurethanes

CPI  
Manufacturing  
Catapult

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

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Chemicals  
Li-ion Battery /  
Electrolyte

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Ethane Import  
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Chemicals  
Acrylics

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Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

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OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

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Polymer  
Recycling

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Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
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Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

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Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

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Chemicals  
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Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

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OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
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Poseidon  
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Sequens  
Fine Chemicals

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Chemicals  
Acrylics

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Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

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Chemicals  
Acrylics

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Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
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Mitsubishi  
Chemicals  
Acrylics

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Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
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Chemicals  
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Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
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Poseidon  
Plastics  
Polymer Recycling

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Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

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Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
Fine Chemicals

Mitsubishi  
Chemicals  
Acrylics

Mitsubishi  
Chemicals  
Li-ion Battery /  
Electrolyte

Port of  
Middlesbrough  
Logistics

SABIC  
Ethane Import  
Facility

GE  
OSW

Sembcorp EFW Power Station  
Power / Utilities

Huntsman  
Polyurethanes

Applied Graphene

Teesside  
University

Sequens  
Fine Chemicals

Materials  
Processing Institute  
Materials and  
Process Innovation

2M  
Chemical Blending

ENVA  
Wood Recycling

Biffa  
Polymer  
Recycling

Poseidon  
Plastics  
Polymer Recycling

Sequens  
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## Largest industrial clusters by emissions



# ROUTE TO CLUSTER NET ZERO



## HYDROGEN



bp  
H2Teesside,  
Hygreen



kellas  
MIDSTREAM  
H2NorthEast



Department  
for Transport

Transport Hub

PROTIUM

Green Energy



## RENEWABLE POWER SECTOR



Net Zero  
Teesside



bp



WHITETAIL  
CLEAN ENERGY

EFW PROJECTS



semcorp



MGT  
Teesside

OFFSHORE  
WIND



equinor



SSE



## CARBON CAPTURE, USAGE & STORAGE



Net Zero  
Teesside

# TEES VALLEY CLUSTER PLAN



## Collaboration

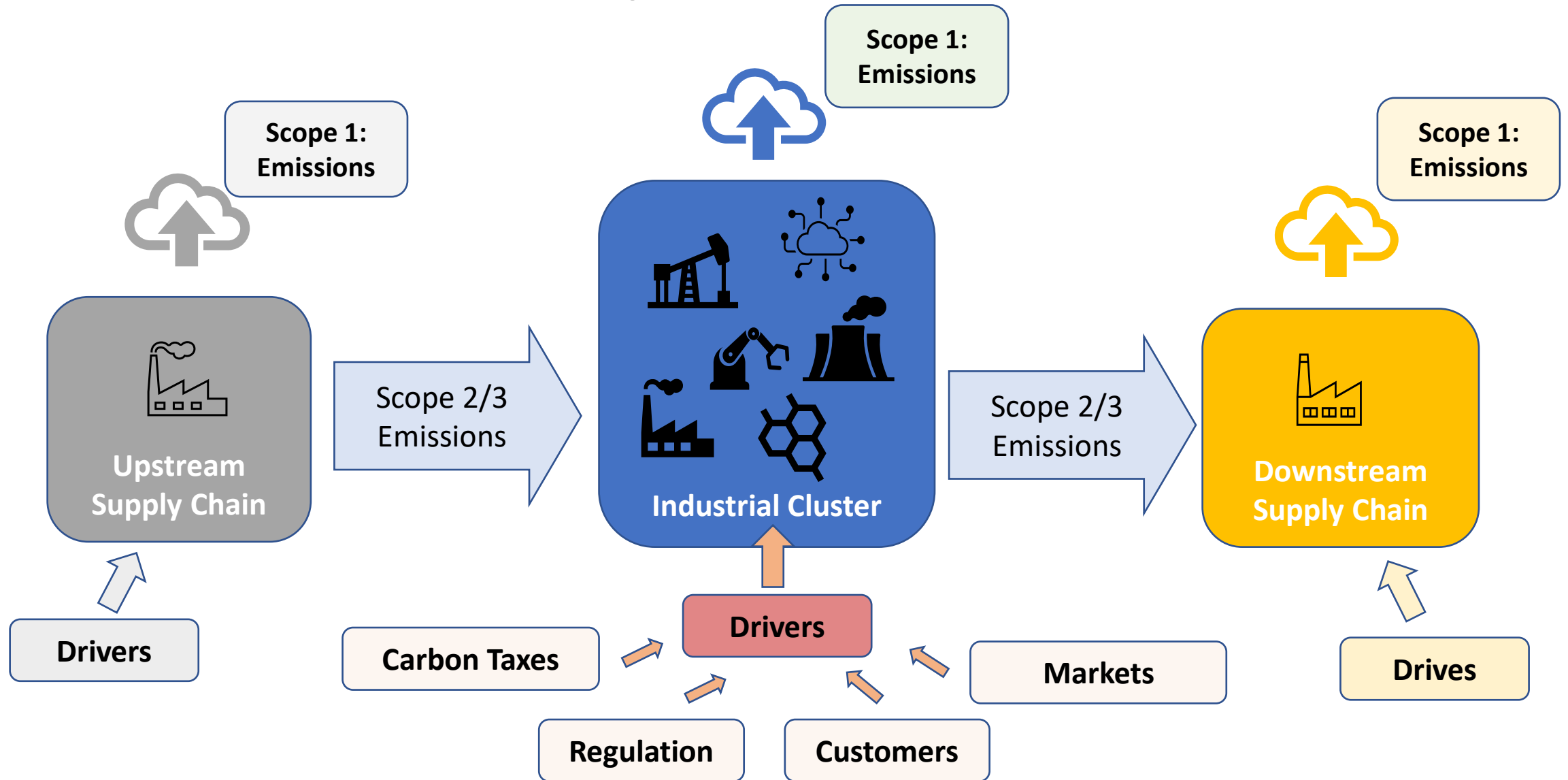
- TVCA ; NEPIC ; bp

## Tees Valley Net Zero Cluster Plan - Stage 2

- £1.13 million funding > *Innovate UK*
- 2 years to March 2023
- All aspects of decarbonisation
  - CCUS | Renewable & Green Electricity | Hydrogen
- Key Aims:
  - Produce a **roadmap** to decarbonisation 2040
  - Identify barriers & enablers to decarbonisation



# Industrial Cluster Make-Up





# INDUSTRIES IN THE TEES VALLEY CLUSTER

**NZT Power**

**DOGGER BANK WIND FARM**

**EDF**

**WHITETAIL CLEAN ENERGY**

**SOFIA OFFSHORE WIND FARM**

**MGT Teesside**

**Power**

**ConocoPhillips**


**Navigator**


**px**


**Oil & Gas**


**exolum**


**kellas MIDSTREAM**


**ensUS**

**alfanar**

**Biofuels & EfW**

**Greenergy**

**suez environnement**

**Circular Fuels Ltd**

**BRITISH STEEL**

**VENATOR**

**TATA STEEL**

**HUNTSMAN**

**AngloAmerican**

**alpek**

**Chemicals**

**sabik**


**MITSUBISHI CHEMICAL**


**FUJIFILM**


**Quorn**


**CF**


**Diosynth biotechnologies**

**bp**

**P**

**Hydrogen**

**kellas MIDSTREAM**

**BOC**

**PD PORTS**

**Northern Gas Networks**

**JM**

**Infrastructure**

**sembcorp**

**NORTHERN POWERGRID**

# Policies



## National Coordination

Strategy / Governance / Regulation



## Internal Collaboration

Feedstocks / Services / Infrastructure



## Investment and Business Models

Plans / Projects / Opportunities



## Implementation

Supply Chain / Education / Skills & Jobs



## Communities & Stakeholders

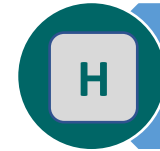
LAs / CAs / LEPs / Public

# Projects



## CCUS

Cluster Sequencing Phase 1/2



## Hydrogen Economy

Blue & Green Hydrogen



## Renewable Power

Wind | Solar | Nuclear



## Infrastructure

Hydrogen transport | Shared services | DNO



## Carbon Displacement

Circular Economy | e-fuels | SAF



## Negative Emissions

BECCS | EfW+CCS

# GROUND ZERO FOR NET ZERO

## Creating the world's first Net Zero industrial cluster by 2040

- The go-to region to develop clean gas, hydrogen and low-carbon technologies
- The most developed and deliverable CCUS project – Net Zero Teesside
- UK's largest Green and Blue hydrogen projects
- Premier offshore wind location
- Multimillion-pound investments from SeAH Wind,, Net Zero Teesside, bp



# EAST CO<sub>2</sub>AST CLUSTER

Northern  
Endurance  
Partnership



NORTH SEA

145km

103km

MIDDLESBROUGH ●

DARLINGTON ●

**PROJECTS IN TEESSIDE INCLUDING**

Net Zero Teesside

BOC bp CF

kellaz MIDDLEHAM NZT Power suez

TV ERF 8 RIVERS

**UP TO 10 MTCO<sub>2</sub>E CAPTURED**

● YORK

HULL ●

GRIMSBY ●

SCUNTHORPE ●

● LEEDS

● SHEFFIELD

**PROJECTS IN THE HUMBER INCLUDING**

**ZEROCARBON HUMBER**

drax equinor MITSUBISHI POWER

sse Thermal TRITON POWER uni per VELOCYS

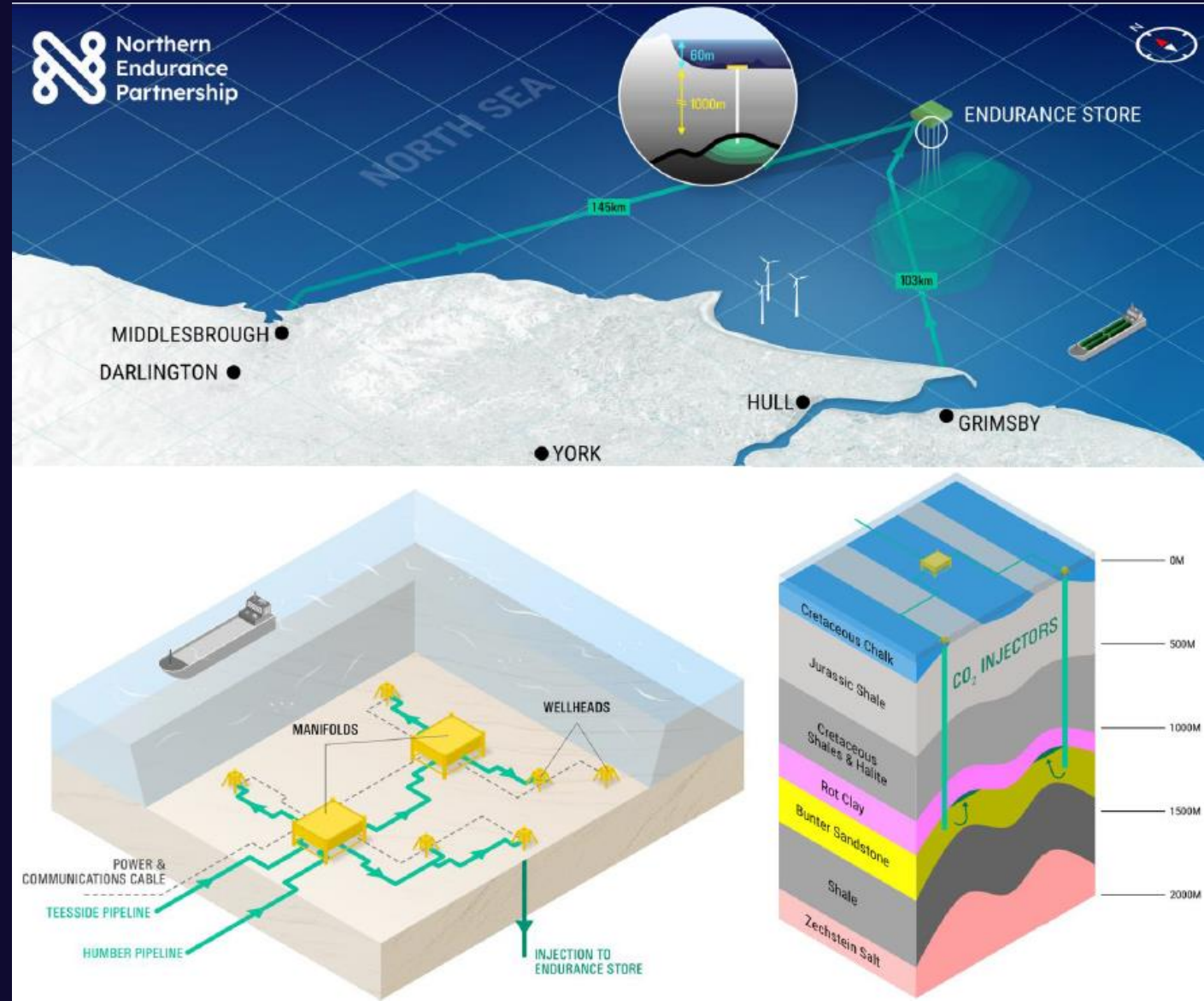
**17+ MTCO<sub>2</sub>E CAPTURED**





# THE ENDURANCE CARBON STORE

- First of a kind offshore low carbon CCS infrastructure in the UK
- CO<sub>2</sub> injection into a **saline aquifer** is a worldwide proven concept
- Largest saline Aquifer in the southern North Sea – **capacity to store 450m tonnes of CO<sub>2</sub>** with potential to extend to ~1 billion tonnes with nearby stores
- Includes **CO<sub>2</sub> pipelines** from Teesside and the Humber
- Compression and pumping systems to a common subsea manifold and well injection site at the **Endurance store**



# ENERGY OPPORTUNITIES

- Offshore wind
  - Sofia landing site
  - Dogger Bank landing site
  - Near Shore wind farm
- Solar –
  - EDF near Redcar
  - Plans for sites on Teesworks
  - Plans for site at Airport
- Battery Storage – Wilton
- Thermal
  - Net Zero Teesside – Gas peaker plant connected to CCU
  - Whitetail – Super critical CO<sub>2</sub> power on Wilton International site
  - MGT 300MW biomass plant
  - Energy to Waste – Including
    - New Council Teesworks site
    - PMAC
    - Suez





# TEESWORKS – THE SITE

- The UK's largest and most connected industrial zone
- 4,500 acres of land on the banks of the River Tees at the industrial heart of Teesside
- Focus on sustainable energy and clean energy
- Connected by sea, road, rail and air to global markets





# TEESWORKS





# SOUTH BANK





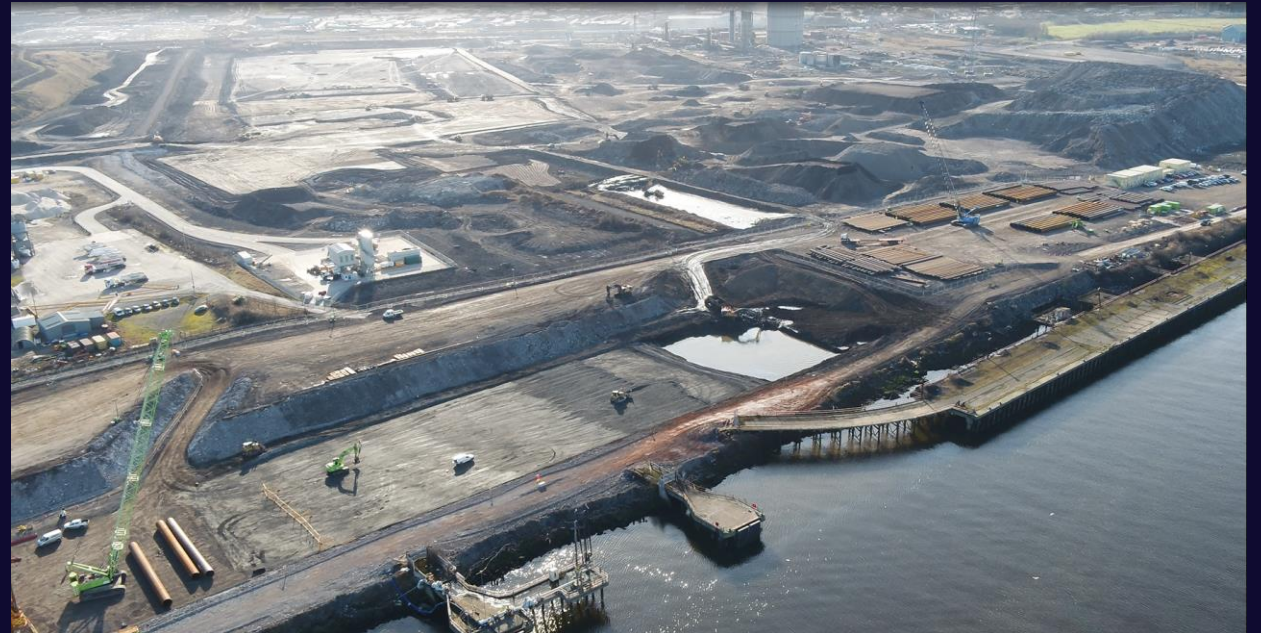
# PROGRESS SLIDE ON SOUTH BANK

- £107million investment from UKIB – its first ever
- Phase One 450metres to be complete by March 2023
- Planning permission granted for 76,500m<sup>2</sup> wind turbine blade manufacturing facility

January 2021



February 2022





# GROUND REMEDIATION WORKS EXAMPLE – FEB 2021





# GROUND REMEDIATION WORKS EXAMPLE – JULY 2021





# SeAH - MONOPILES

- SeAH Wind £400m monopile manufacturing facility
- Factory will produce 3,000 tonne XXL monopiles
- Ground Breaking 7<sup>th</sup> July 2022
- 750 direct, 1500 indirect jobs in operation



# HYDROGEN



Region has existing hydrogen storage caverns



Currently produce more than 50% of the UK's hydrogen



Hydrogen pipework connecting major cluster sites



Tees Valley announced as the DfT Hydrogen Transport Test Hub



Significant hydrogen production planned on and around Teesworks

## PROJECTS

### Blue hydrogen

- Kellas (1GW plant)
- bp (1GW plant)

**Green hydrogen** – linked to renewable energy production

- Protium (up to 60MW)
- EDF (hydrogen connected to near shore wind)
- bp (500MW)

# HYDROGEN TRANSPORT

- DfT Hydrogen Transport Test Hub
- Major trials bidding for funding
- Looking at Airport Operations





# HYDROGEN FOR THE HOME

- Northern Gas Networks proposal for up to 2,000 homes and businesses in Redcar to be heated with hydrogen gas from 2025
- Plans for residents and businesses to be powered by locally produced hydrogen
- Teesside targeted as hub for green hydrogen production by 2025







Committed to sustainability and creating a cleaner future

- Part of a SAF research partnership with the Centre for Process Innovation (CPI), Rolls Royce and Airbus
- Solar opportunities being progressed
- £2.5million region-wide hydrogen vehicle refuelling station trial





# CIRCULAR ECONOMY

Waste / bio feed to :

- Bio ethanol
- Diesel
- Sustainable Aviation Fuel
- Bio Coal
- Bio LPG
- Power





# CIRCULAR ECONOMY

## alfanar – Lighthouse Green Fuels Project

- Sustainable aviation fuel from waste
- £1billion investment
- Potential to produce 80% less greenhouse gas than its fossil fuel equivalent



## Circular Fuels - Bio Gas - LPG from Waste

- £150million investment at Teesworks site

# BIO ECONOMY – FROM MEAT FREE TO VACCINES

## Manufacturing Cluster

- FujiFilm Diosynth
- Quorn
- KD Pharma
- Ensus
- Absolute Antibody
- Cambridge Research biochemicals

## Research

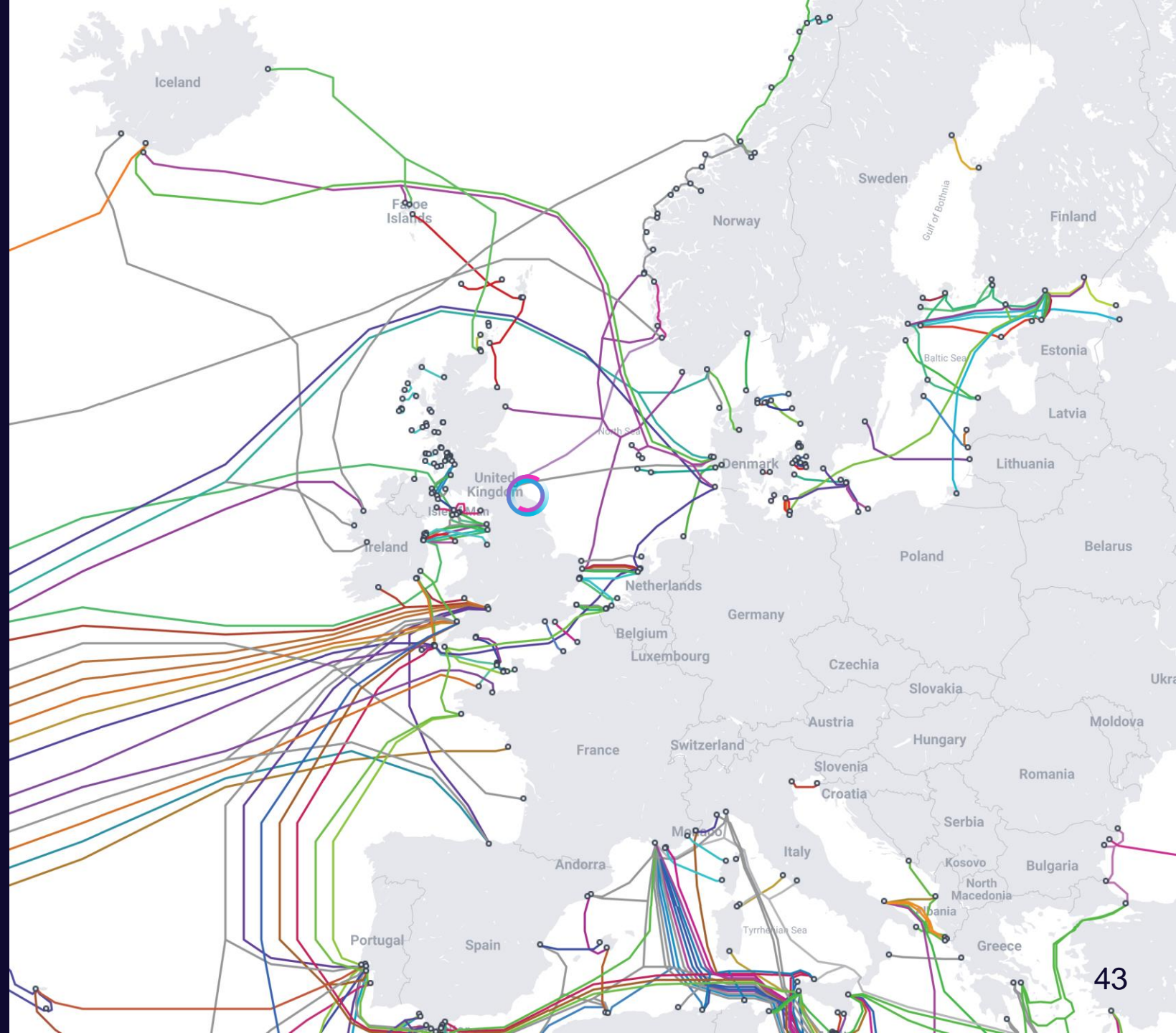
- Teesside uni Horizon Centre
- CPI - Biologics Centre
- CPI - Novel Food Centre



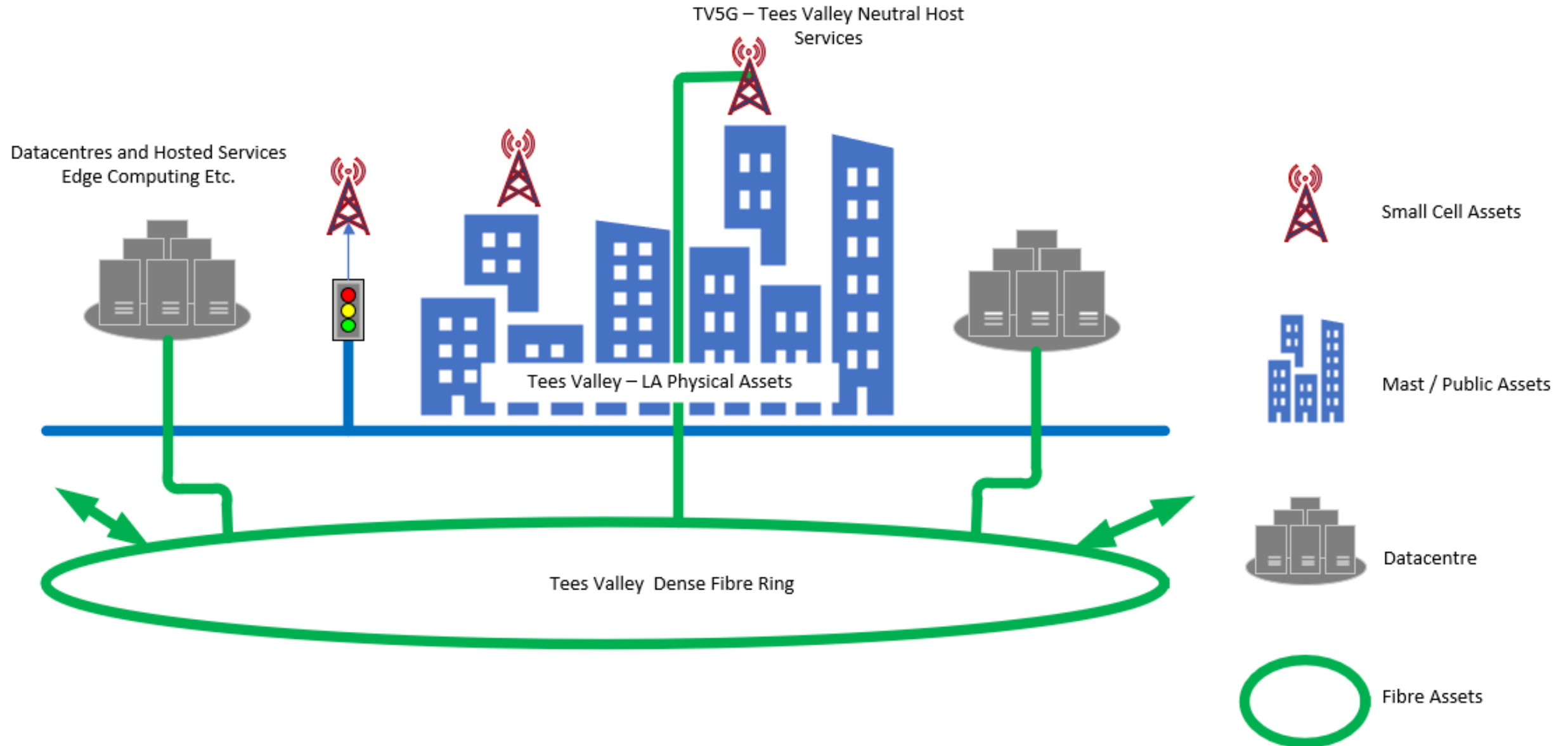


# REDCAR INTERCONNECTOR

The network will link to the Redcar Interconnector and onward to Europe, building on the North East's location on five national fibre optic trunk routes, which represent  $\frac{1}{4}$  of the UK's internet capacity



# SMART REGION



# NET ZERO STRATEGY – NATURAL CAPITAL

- Tees Valley Net Zero Strategy
  - *Focusing on industry, transport, residential and Natural Capital*
- Responsible authority for the Local Nature Recovery Strategy
  - *Working in partnership with local organisations*
- Significant Tree Planting





The background image shows a red brick house with a dark tiled roof. Several solar panels are mounted on the roof. A blue semi-transparent rectangular overlay covers the upper middle portion of the image, containing white text. Two chimneys are visible on the roofline.

**Warmer Homes – Getting low income properties to EPC C and above.**

- **Local Schemes**
  - Net Zero Hub
  - Sustainable Warmth – Home Upgrade Grant
  - Social Housing Decarbonisation Fund
- **Net Zero Hub**
  - Green Homes Grant – Local Authority Delivery 2



The background image shows a close-up of a brick house's exterior. A dark brown tiled roof is visible, featuring a brick chimney with a terracotta-colored cap. Several solar panels are mounted on the roof, with some showing a blue monocrystalline surface. The brickwork is a mix of red and tan colors. A white-framed window is partially visible at the bottom of the frame.

## Warmer Homes – Project Details

- **Project ending**
  - Green Homes Grant - £53m, 3913 homes
- **In delivery**
  - Sustainable Warmth – Home Upgrade Grant - £3.2m, 260 homes
  - Social Housing Decarbonisation Fund - £4.5m, 231 homes
- **In future (bidding)**
  - Social Housing Decarbonisation Fund 2 - £81m, 5515 homes





# INCA

Industry Nature Conservation Association



TEES VALLEY  
COMBINED  
AUTHORITY

TEES VALLEY MAYOR





**INCA's aim** - to avoid conflict and build trust between industrial developers and conservationists by;

- Working with developers to facilitate economic development
- Providing ecological advice to businesses
- Helping steer a course through obligations, e.g. biodiversity net gain, protected species and habitats.
- Carrying out ecological surveys
- Habitat Management / Creation on our members' sites
- Promoting positive aspects of Tees Valley's environment and the contribution made by Industry

# INDUSTRY PARTNERS



TEES VALLEY MAYOR





# TEES RIVERS TRUST

## Tees Estuary Program of Works



- **Installing oyster nurseries**
  - 1 oyster filters 200 liters seawater per day
  - 1 oyster can remove substantial nitrates and nitrites from water bodies
- **Planting seagrass meadows**
  - - seagrass sequesters carbon 35 times faster than the Amazon rainforest
- **Restoring Intertidal habitat**
  - - coastal zone covers 8% global surface but is responsible for more than 43% of the global value of ecosystems services (approx. US\$ 22.9 Trillion)



# QUALITY OF LIFE

The people living in the Tees Valley are some of the happiest in the country. With low commute times people spend less time travelling to work and more time to enjoy all the benefits the coast and countryside has to offer.

Cost of living is also low in comparison to other large cities, which means that quality of life is much higher, leading to a happier and healthier workforce.



## Life Satisfaction:

Tees Valley and  
surrounding area: **7.52**  
England average: **7.38**



## Cost of living

(house price to earnings ratio)

Tees Valley: **4.98**  
England average: **7.84**



## Happiness:

Tees Valley and  
surrounding area: **7.64**  
England average: **7.31**





Thank you