

Technology Driving Transition



**Net Zero
Technology
Centre**

Technology Driving Transition



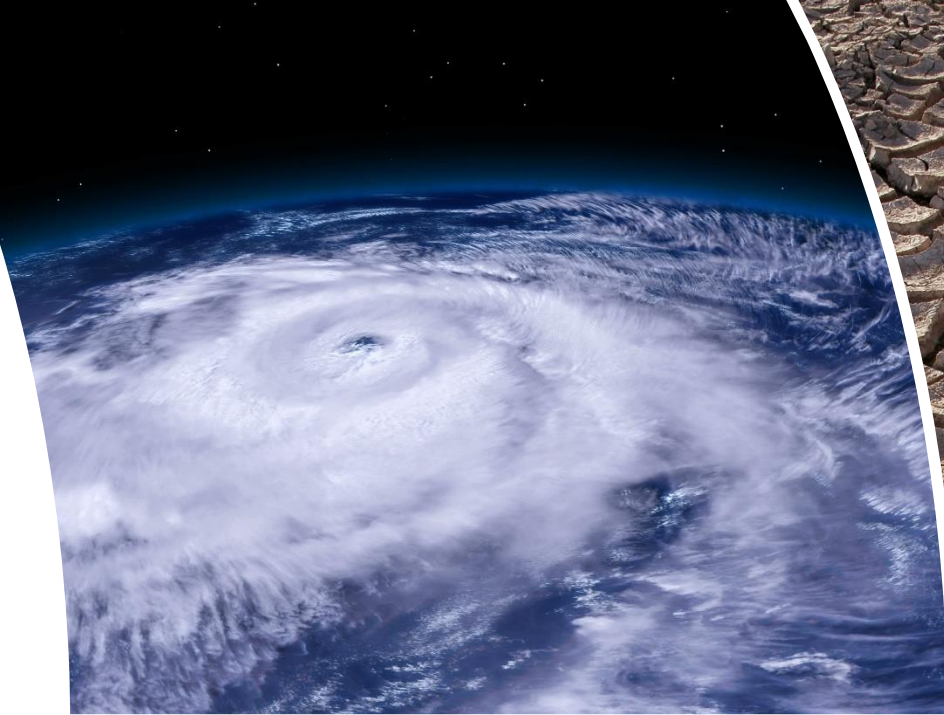
Developing technology to deliver an affordable net zero Energy Industry



**Innovation
Opportunity
&
the Energy Transition**



Climate Change A Global & Local Challenge





2050



The Energy Transition



A Just Transition

CGTN ENERGY

THE UK GOVERNMENT'S
"TEN POINT PLAN
FOR A GREEN
INDUSTRIAL
REVOLUTION"
TO REACH NET-ZERO:

December 2020

The Sixth Carbon Budget
The UK's path to Net Zero

Climate Change Committee

Just Transition
Commission

A national mission for a fairer,
greener Scotland

ENERGY WHITE PAPER

Powering our
Net Zero Future

December 2020 (CP 53)

HM Government

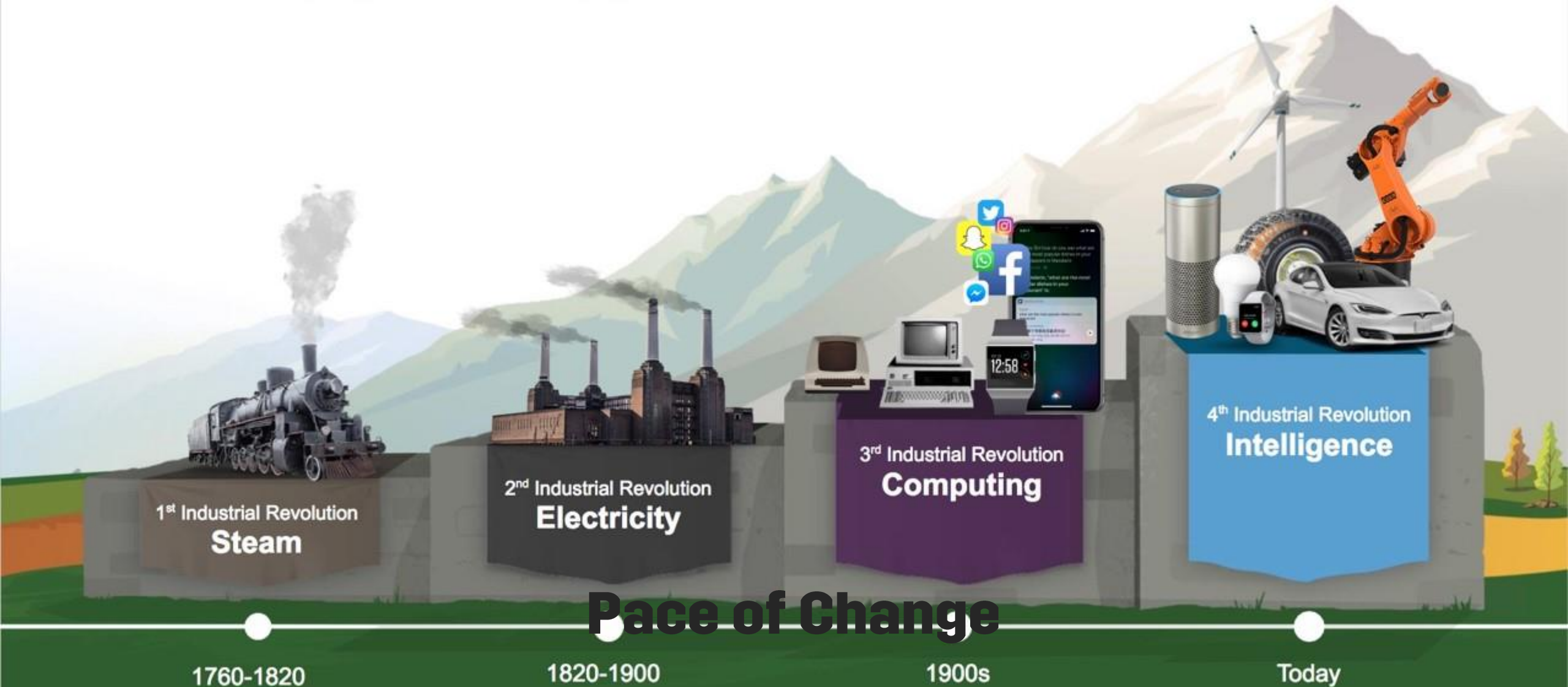
NET ZERO

Update to the
Climate Change Plan
2018 - 2022

Recovery & Green Recovery
and a Path to Net Zero

Scottish Government

Fourth Industrial Revolution





CAN YOU SPOT IT?

Only one of the 30 every-day products shown here is not made using petrochemicals derived from oil and natural gas.
Can you find it?



An Opportunity



Although unprecedented in its scale and impact, the energy transition offers an ***opportunity to shape the future of the energy system*** and ensure its sustainability, security, affordability and inclusiveness in the long term

North Sea: transition to net zero



Net Zero Operations



Vision 2035 production x today's oil & gas prices

Renewables Integration



CCC wind x £40/MWH

Hydrogen



CCC H₂ x £2/kg

CCUS



CCC CCS x £50/t



2020

£15Bn

£1Bn

•

•

£18Bn

2030

£16Bn

£5Bn

£1Bn

£2Bn

£25Bn

2040

£12Bn

£7Bn

£12Bn

£2Bn

£33Bn

2050

£9Bn

£11Bn

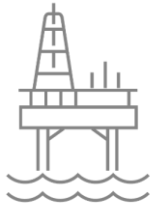
£14Bn

£4Bn

£38Bn



Critical Technology innovation needed for 2050



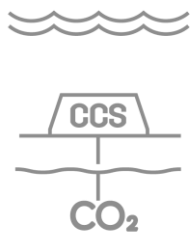
Oil & Gas

- Ammonia or other low-carbon fuelled turbines
- Marine hydrogen transport solutions
- Platform electrification (AC/DC/cabling solutions)
- Subsea electrification cost reduction



Offshore wind

- UK-specific floating wind foundations
- Innovative floating wind mooring systems
- Dynamic cabling solutions to reduce wind downtime



Carbon capture & storage

- Modelling of geological behaviours of CO₂
- Modular, retrofittable carbon capture solutions
- Direct air/seawater capture
- CO₂ compatible well plug and abandonment techniques
- High-capacity sorbents durable at high temperatures



Hydrogen

- Seawater electrolysis
- Electrolyser catalyst innovation
- Subsea electrolyser systems incorporating compression
- Improved efficiency of existing SMR and ATR technology
- Enhanced SMR reactor membranes and catalysts
- Alternative blue hydrogen production methods
- Inter-seasonal hydrogen storage

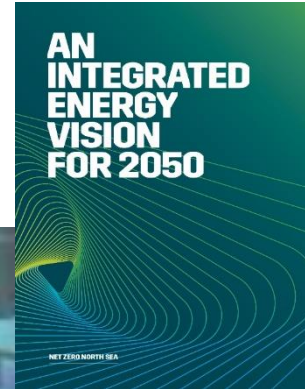


Integrated Energy Future



Innovation in Action

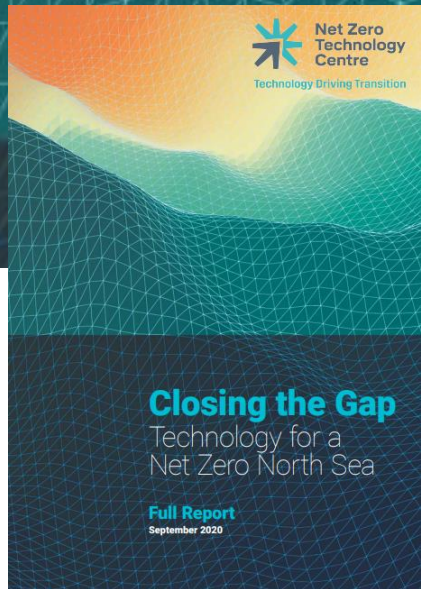
**Investing at Pace
Driving the Transition
To Own the Transition**



**Integrated Energy Systems
Wind supporting O&G
Blue leading to Green Hydrogen**

**Predictive AI enhanced software to
Robots & Unmanned vehicles
Changing how we work today**

**Drive Value
Create Jobs
Deliver an Energy
Transformation**





#HelloFuture