



UK Research  
and Innovation

# Building Capacity for CCS Deployment

## A view from the UK's Industrial Decarbonisation Challenge

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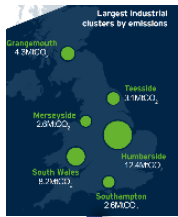
IDC Challenge Director



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Industrial Decarbonisation Challenge

# Industrial Decarbonisation – Political Landscape Development



**Industrial Clusters Mission:** “We will establish the world’s first net-zero carbon industrial cluster by 2040 and **at least one** low-carbon cluster by 2030”

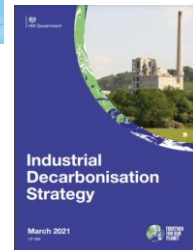


**Government Budget March 2020:**

“..... **at least two** UK sites, one by the mid-2020s, a second by 2030. This will be supported by the creation of a new Infrastructure Fund of at least £800 million.



**The Ten Point Plan for Green Industrial Revolution November 2020:** “We will .. aim for **four of these sites** by 2030.”



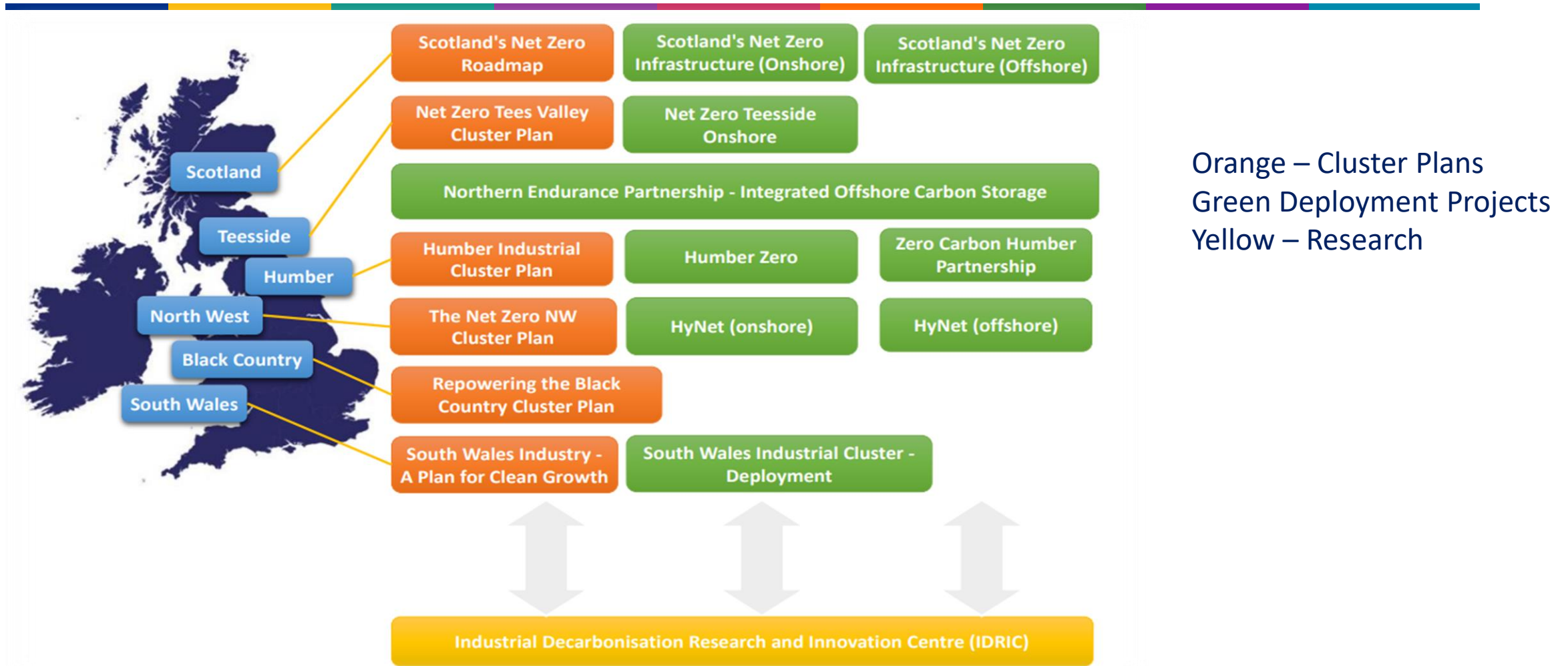
**Industrial Decarbonisation Strategy March 2021:** “four of our major industrial regions linked up to the necessary decarbonisation infrastructure by 2030; around **3 MtCO<sub>2</sub>** of industry emissions captured each year by 2030



**Net Zero Strategy, 19 October 2021:**  
Ambition to deliver **6 MtCO<sub>2</sub>** per year of industrial CCUS by 2030



# Industrial Decarbonisation Challenge - Projects



# What Does a Successful Industrial Cluster Look Like?

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- Clusters should be able to demonstrate cooperation between businesses and organisations across the region, and evidence joint decision-making for the benefit of the wider cluster.
- Clusters should consider wider societal benefits of their activity. For example, the importance of public benefit from local decarbonisation, and alignment with public funding and local priorities.
- Clusters should have a membership that represents the industries within their geographies i.e. not just a small subset. They will have engaged relevant public sector organisations and have support from the communities in which they operate.
- Clusters should realise the wider benefits that decarbonisation can bring for the region, going beyond individual decarbonisation projects. ... to maximise emissions reductions potential and the development of supply chains and jobs.

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# The need for an integrated approach to establish a net-zero cluster



A holistic and collective approach is required to optimize emissions solutions and create an integrated energy system that maximizes system value outcomes across the cluster.

## SYSTEMIC EFFICIENCY AND CIRCULARITY



Increase circularity within a cluster through cross-entity waste utilization



Integrate processes within a cluster to share energy and material streams



Provide cost-effective system benefits outside the cluster

## HYDROGEN



Leverage electricity and heat from nearby zero carbon sources (wind, solar, nuclear, biomass)



Produce low-to-zero carbon hydrogen from the most economical source (e.g. blue, green)



Use produced H<sub>2</sub> as an alternative fuel for hard-to-electrify industrial processes, building heating, and transport

## DIRECT ELECTRIFICATION AND RENEWABLE HEAT



Electrify low-to-medium temperature and pressure processes



Generate low-cost, renewable electricity and heat onsite (e.g. rooftop solar, biomass, CSP)



Pursue shared infrastructure (e.g. microgrid, storage, flexibility)

## CARBON CAPTURE, UTILISATION AND STORAGE (CCUS)



Capture carbon from energy and hydrogen production



Use captured carbon for industrial and manufacturing processes



Store carbon underground where feasible

