

## Results of Competition: ISCF Decarbonisation of Industrial Clusters Phase 2: Cluster Plan

Competition Code: 2005\_ISCF\_CRD\_IDC\_CLUSTER\_P2

Total available funding is £8,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CR PLUS LIMITED	South Wales Industry - A Plan for Clean Growth	£590,486	£413,340
ASSOCIATED BRITISH PORTS		£0	£0
CAPITAL LAW LIMITED		£130,000	£78,000
CARBON8 SYSTEMS LIMITED		£12,485	£8,740
CELSA MANUFACTURING (UK) LIMITED		£86,389	£43,194
CONFEDERATION OF PAPER INDUSTRIES LIMITED		£6,931	£4,159
CONNECT & CONVEY LIMITED		£84,683	£59,278
COSTAIN LIMITED		£46,862	£23,431

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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DRAGON LNG LIMITED	£0	£0
ENERGY SYSTEMS CATAPULT LIMITED	£49,992	£49,992
ENVIRONMENTAL RESOURCES MANAGEMENT LIMITED	£147,380	£73,690
FRONT DOOR COMMUNICATIONS LIMITED	£21,466	£15,026
LIBERTY STEEL NEWPORT LIMITED	£34,909	£17,454
milford haven port authority	£179,634	£107,780
National Grid Electricity Transmission PLC	£14,200	£0
Neath Port Talbot Council	£0	£0
OFFSHORE RENEWABLE ENERGY CATAPULT	£49,917	£49,917
Pembrokeshire County Council	£0	£0
PROGRESSIVE ENERGY LIMITED	£56,767	£39,737
ROCKWOOL LIMITED	£7,939	£0
RWE GENERATION UK PLC	£31,200	£0
SECTOR DEVELOPMENT WALES PARTNERSHIP LIMITED	£0	£0
SIEMENS PUBLIC LIMITED COMPANY	£28,533	£14,266

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TARMAC TRADING LIMITED	£15,477	£7,738
University of South Wales	£412,675	£412,675
VALE EUROPE LIMITED	£95,845	£47,922
VALERO ENERGY LTD	£0	£0
WALES & WEST UTILITIES LIMITED	£65,000	£0
WESTERN BIO-ENERGY LTD	£46,724	£32,707
WESTERN POWER DISTRIBUTION PLC	£17,536	£0

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## Project description - provided by applicants

The South Wales Industrial Cluster (SWIC) is a diverse mix of critical industry that have come together to collaboratively achieve common objectives for decarbonisation and clean growth delivering job security. The regions diverse industrial base presents both common and unique challenges. Sectors represented include steel/oil-refining/power/ paper/Nickel/insulation/chemicals/LNG import/Royal-Mint/general-manufacturing.

SWIC aims to progress a cluster plan driven by a vision of "developing a world leading truly sustainable industry befitting the societal needs of 2030, 2040, 2050 and beyond" incorporating a circular economy revolution leading to a smarter, greener, and healthier society.

SWIC's goal is NZC by 2040. Current carbon emissions are 16MtCO<sub>2</sub>/y (5% of UK emissions), comprising 10MtCO<sub>2</sub>/y direct from industry and 6MtCO<sub>2</sub>/y from power generation. Achieving NZC will provide a significant contribution to the UK's goal of becoming net zero by 2050. NZC must be realised in the broader context of 'People, Planet and Profit', achieving truly sustainable clean growth, within a globally competitive market, maintaining a growing, clean vibrant and diverse industrial sector region with potentially 40,000+ new jobs arising.

The Phase-2 work will continue to define NZC options for all types of members including two of the largest industrial UK CO<sub>2</sub> emitters plus many other large emitting sites from diverse sectors spread across the whole region. Phase2 will identify the best low carbon energy options that will work for multiple industry users and define distinctive 'mini-clusters' in the region. This will inform and assist planning for significant local and regional infrastructure. The 4 coastal 'mini-clusters' will connect the largest CO<sub>2</sub> emitters, creating opportunities for carbon capture and use in addition connections to UK carbon storage facilities. Low carbon energy infrastructure including renewables and hydrogen will also be developed. (Q3-appendix).

SWIC Plans centre around a 5 stepped approach to NZC, 5 spatial zone types will allow SWIC to take immediate steps toward NZC with a low chance of incurring "Regret Capital". As well as targeting a NZC cluster by 2040, this plan focuses on societal needs, circular economy and clean growth aspirations of the region, tackling the common and unique commercial & operational challenges facing SW industry.

SWIC will work with other UK cluster regions to optimise decarbonisation outcomes.

Specialist energy consultancy CR Plus are leading the project supported by a wide breadth 20+ key partners. Phase2 represents an opportunity to coalesce efforts, cement a direction and to further scope and define the action required to achieve the SWIC vision.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BLACK COUNTRY CONSORTIUM LIMITED	Repowering the Black Country Phase 2 Cluster Plan	£140,277	£140,277
CAMIRUS LIMITED		£142,706	£99,894
CR PLUS LIMITED		£291,742	£204,219
DISTRICT EATING LTD		£74,999	£52,499
KEW PROJECTS LIMITED		£213,750	£149,625
M3MAS LIMITED		£242,854	£169,998
Pro Enviro Ltd		£558,320	£390,824
University of Birmingham		£122,295	£122,295

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University of Warwick		£169,407	£169,407
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## Project description - provided by applicants

The Black Country is one of seven strategic industrial clusters across the UK being supported by BEIS and Innovate UK to decarbonise by 2040. By 2030, without radical action, Black Country industry will be responsible for 2.3MtCO<sub>2</sub> emissions a year, from an industrial base of more than 3000 energy-intensive businesses, many still engaged in the region's traditional metal processing operations.

This project aims to reduce these emissions to zero by 2030 through a co-ordinated programme of transformational projects focused around a new type of industrial estate: the zero carbon hub.

Zero carbon hubs will be based around anchor industrial processes, strategically-selected to match Black Country skills and strengths (for example aluminium reprocessing). Each hub will contain a mix of businesses carefully selected to complement each other by thinking about their energy and waste flows. For example, where metal manufacturing results in significant quantities of waste heat, this might be used to generate steam for use in food processing or urban agriculture, or supplied to neighbouring housing or offices via district heating schemes.

Each hub will have its own energy centre, designed to work alongside a decarbonised national electricity grid to supply Black Country industry with clean power and heat at globally-competitive costs. Many of these energy centres will be built around Black Country-manufactured new energy technologies converting commercial waste into heat, electricity and hydrogen.

The project will work with other industrial clusters around the UK coast to build new supply chains and markets for hydrogen and carbon. We will work with the Universities of Birmingham and Warwick and with the Industrial Decarbonisation Research and Innovation Centre (IDRIC) in Edinburgh to deploy the latest energy technologies and circular economy methods in the Black Country.

We anticipate developing four demonstration hubs during the two year period of the project and stimulating the deployment of a further 10-50 to achieve the cluster's zero carbon goal by 2030. Innovate UK funding will be used alongside a small amount of economic development funding to stimulate over £1bn of commercial investment in the region.

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Tees Valley Combined Authority	Net Zero Tees Valley: Cluster Plan Stage 2	£334,843	£334,843
BP EXPLORATION OPERATING COMPANY LIMITED		£0	£0
THE NORTH EAST OF ENGLAND PROCESS INDUSTRY CLUSTER LIMITED		£789,714	£552,800

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## Project description - provided by applicants

The Industrial Clusters Mission has set an ambition to establish at least one low-carbon industrial cluster by 2030 and the world's first net-zero carbon industrial cluster by 2040\.

The Tees Valley is the UK's most compact and integrated industrial cluster with a radius of 5 miles. The cluster includes several of the UK's top CO2 emitters and is responsible for 8.8 million tonnes of CO2; the Tees Valley industrial cluster generates £12bn of exports annually, employs over 12,000 people and currently contributes some £2.5bn to UK GVA.

This project will produce a plan which outlines how the Tees Valley Industrial Cluster can become net zero by 2040\. It will identify the concepts required both on a 'plant by plant' basis and the technologies and infrastructure that would then be needed to integrate and link them together into a net-zero cluster. It will indicate the expected costs and highlight the key enablers and barriers to implementation together with suggested timelines and the need and opportunity for innovation.

The project will provide the evidence base that will support industrial companies corporate decisions on decarbonisation as well as regional and national Government in making the most focussed and effective policy decisions; it will provide the information needed for companies to build on, when undertaking more detailed design and piloting of technologies. The project will share its findings with other industrial clusters and more widely to ensure lessons learned are shared across the UK.

This project follows on from the successful stage 1 bid, during which an approach was developed to produce a Cluster Plan for the Tees Valley Industrial Cluster.

The cluster plan to be developed is expected to identify the most appropriate range of technologies and potential pathways for the various industrial producers and energy generators in the Tees Valley, considering both existing and future new entrants. It is expected that this plan will combine carbon capture at scale, fuel switching to Hydrogen, integration of renewables, low carbon energy sources, feedstocks changes, together with improved process and energy efficiencies.

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NECCUS	Scotland's Net Zero Roadmap (SNZR)	£160,893	£112,625
AKER SOLUTIONS LIMITED		£149,998	£74,999
COSTAIN LIMITED		£49,889	£24,944
DOOSAN BABCOCK LIMITED		£89,983	£44,992
ENERGY SYSTEMS CATAPULT LIMITED		£239,833	£239,833
HALLIBURTON MANAGEMENT LIMITED		£60,000	£30,000
OPTIMAT LIMITED		£160,014	£112,010
PALE BLUE DOT ENERGY LIMITED		£79,775	£55,842
THE OIL & GAS TECHNOLOGY CENTRE LIMITED		£39,997	£39,997

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University of Edinburgh	£40,003	£40,003
University of Strathclyde	£29,987	£29,987
WOOD GROUP UK LIMITED	£130,026	£65,013

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## Project description - provided by applicants

### SNZR; Scotland's Net Zero Roadmap

To achieve Net Zero by 2045 Scotland needs to decarbonise industry, transport, heat and power. Scotland's Net Zero Roadmap project (SNZR) will provide the roadmap to enable large-scale industrial CO2 emissions reduction in a way that focuses on ensuring the continued, but evolving, contribution of high-value industry and employment in a future Net Zero economy, and supports other UK regions to do likewise.

Scotland emitted 41.6 million tonnes of greenhouse gases in 2018, of which 11.9 million tonnes were attributable to business and industrial processes. The top five emitting sectors in industry across Scotland are: Oil and Gas, Chemicals, Paper and Board, Cement and Glass and Environmental and Waste Services, as identified from sources above reporting thresholds. 74.2% of the greenhouse gases in 2018 were CO2, meaning that focusing on reducing CO2 emissions around the Forth (Lothian, Grangemouth, Fife) and St Fergus areas, which together account for over 9 million tonnes of CO2, provides a clear pathway towards Net Zero.

Crucially, SNZR will provide the roadmap that enables the deployment of options in a way that ensures competitive decarbonisation through continued and growing prosperity across the economy.

CCS is necessary, according to the Committee on Climate Change (2019), if we are to meet our net zero obligations. Capturing CO2 from industrial emissions and manufacturing hydrogen with CCS, provide two of the lowest cost and fastest means to decarbonise. These are options that offer opportunities for the continued but evolving role of our current energy supply industries, but which need to develop in a way that sustains the competitiveness of our high-value industries.

Scotland is in a strong position to lead this new large scale CO2 management industry. Offshore Scotland has some of Europe's best-characterised and largest CO2 storage sites while CCS and hydrogen will create opportunities for jobs and economic activity and help transition staff employed in sectors such as oil and gas.

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PEEL ENVIRONMENTAL LIMITED	The Net Zero NW Cluster Plan	£53,863	£26,932
CADENT GAS LIMITED		£19,913	£9,956
CHESHIRE & WARRINGTON LOCAL ENTERPRISE PARTNERSHIP		£108,472	£100,000
ENGIE SERVICES LIMITED		£199,713	£99,856
LIVERPOOL CITY REGION LOCAL ENTERPRISE PARTNERSHIP		£4,965	£0
NET ZERO NW LIMITED		£35,000	£0
NORTH WEST BUSINESS LEADERSHIP TEAM LIMITED		£9,000	£0
PROGRESSIVE ENERGY LIMITED		£129,794	£90,856
SP MANWEB PLC		£19,280	£9,640

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UNIPER UK LIMITED		£16,402	£8,201
University of Chester		£19,515	£19,515

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## Project description - provided by applicants

The Net Zero NW Cluster Plan will set out the transition to net-zero for industry in the North West of England and North East Wales. It will describe the investments, technologies, infrastructure changes and sequencing required to fulfil the UK's Industrial Clusters Mission.

The project focuses on two key objectives:

- \* Establishing a low-carbon industrial cluster by 2030, by deploying anchor investment projects including HyNet hydrogen and CCUS infrastructure
- \* Establishing a net-zero carbon industrial cluster by 2040, underpinned by multi-vectored industrial decarbonisation solutions

Industry and public sector bodies, building on the preliminary research completed in Phase 1, will collaboratively promote and engage on plans to decarbonise, ensuring businesses have a strong voice in planning decarbonisation activity in line with current and future business needs whilst leveraging inward investment opportunities.

Energy consumers, networks, generators and academia will research and quantify data and evidence necessary to reach consensus on the most viable options to decarbonise in line with national and local political declarations.

The project will engage and support other complementary initiatives in the region, including but not limited to HyNet (an anchor project), the NW Hydrogen Alliance, E-Port, Mersey Tidal Energy, North West Nuclear Arc and others.

The largest industries in the cluster account for over 6 million tonnes of carbon emissions per annum, from diverse facilities that include oil refining, downstream processing, cement, fertiliser production, glass manufacturing, base chemicals, food manufacturing, automotive, and personal care products. Further industrial emissions are associated with other industry across the broader NW region, extending up to Lancashire and Cumbria. Industrial process energy and heat consumed across all businesses in the area is over 27 TWhr per annum-the region of North Cheshire alone uses 5% of UK power. Several manufacturing and light industrial businesses reliant on energy intensive processes are located in business parks with the potential to employ shared infrastructure, including heat networks, smart grids and decentralised generation.

The project takes an industry and innovation-led approach guiding the decarbonisation of the first UK industrial cluster on a low-cost, low-regrets basis whilst exploring opportunities for shared infrastructure with the South Wales industrial cluster and others.

By enabling multiple industrial facilities to reduce their emissions by the greatest possible extent, with knock-on effects in the reduction of commercial, domestic and transport emissions, the Net Zero NW Cluster Plan will realise over 33,000 new jobs, over £4bn investment and the world's first net-zero industrial cluster.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Hull City Council (on behalf of Humber LEP)	Humber Industrial Cluster Plan	£796,192	£796,192
BRITISH STEEL LIMITED		£56,012	£28,006
CENTRICA STORAGE LIMITED		£41,762	£0
DRAX CORPORATE LIMITED		£149,741	£0
EQUINOR NEW ENERGY LIMITED		£182,250	£0
HCF CATCH LIMITED		£1,190,923	£833,646
KEADBY GENERATION LIMITED		£63,389	£0
NATIONAL GRID CARBON LIMITED		£80,952	£0
PHILLIPS 66 LIMITED		£50,369	£0

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VPI IMMINGHAM LLP		£42,931	£0
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## Project description - provided by applicants

The Humber Local Enterprise Partnership and membership organisation CATCH will work with industrial partners across the Humber to develop the Humber Cluster Plan (HCP) that will enable the Humber industrial cluster -- the UK's largest by carbon emissions -- to achieve net zero by 2040\.

The Humber emits more CO2 than any other industrial cluster (30% more than the next largest), whilst the area is one of the most vulnerable to climate change. A quarter of the Humber's GVA and 1 in 10 jobs depend on these industries, making safeguarding their competitiveness imperative for the local economy as well as strategically important for the UK.

The HCP will be informed by ongoing work on proposed industry-led decarbonisation investments and will have access to world-class industrial expertise to demonstrate how decarbonisation can be achieved at the same time as ensuring the local economy continues to thrive. The plan will provide a blueprint for clean growth to drive a green recovery in the Humber.

A phased approach will prioritise near-term deliverable investments that will see quick results, significantly reducing the Humber's emissions by 2030, mapping out how CCS and hydrogen infrastructure can be scaled up over time, and identifying the full range of interventions required to achieve net zero by 2040\.

HCP will also outline the potential for the Humber's industrial decarbonisation to support decarbonisation beyond the industrial cluster, including maritime in the UK's largest ports complex, road/rail transport and decarbonisation of the gas supply (25% of the UK's supply passes through the Humber). Linked opportunities and implications for renewable energy, especially BECCS and offshore wind (both of which the Humber leads on and are integral to decarbonising industry), will also be identified.

Supporting UK leadership of decarbonisation technologies and the creation of local jobs and supply chains are crosscutting themes where HCP will identify future actions the Humber can take to accelerate the green recovery, including identifying opportunities for inward investing businesses and those looking to diversify to take advantage of low carbon infrastructure.

HCP and the evidence base that will be assembled through its development will provide a clear way forward for industry, Government and local leaders to work together to achieve rapid decarbonisation of the UK's largest cluster, whilst maximising opportunities for local people and businesses to benefit from the transition.

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