BELLONA EUROPA

Building Back Greener

Actions and Opportunities for a Net-Zero Industry in the UK

About Bellona

The Bellona Foundation is a multidisciplinary international environmental NGO based in Oslo, Norway since 1986. Our team consists of about 65 employees with diverse professional backgrounds in communication, engineering, ecology, economics, geosciences, law, physics, and political and social sciences.

Our solution-oriented approach to climate issues follows the evaluation of existing options, assessment of associated challenges and promotion of identified solutions. Supported by the breadth of knowledge and skills of our experts, Bellona follows a holistic, trans-sectoral approach to assess the economics, climate impacts and technical feasibility of possible climate options

We believe that the process of finding solutions to pollution from industries that are currently essential to our economy and the standard of living needs to involve them. Bellona has worked with CO_2 capture and storage since the early 1990s. Today, the organisation is most active at European Union level, in Norway, and in the United Kingdom. The activities include policy development, publications, and other forms of advocacy for industry decarbonisation.

Bellona is engaged on several platforms where we aim to initiate discussion and fuel debate to identify the climate solutions we need. We work jointly with scientific institutions on several European research projects, and have close relationships with fellow climate NGOs across the globe.

1. Introduction

Primary industries are necessary for a prosperous low carbon society. They are essential for downstream manufacturing industries, including the production of climate technologies and infrastructure such as housing insulation, batteries, solar panels and wind farms.

While a key provider of jobs, economic growth and the tools and technologies required to achieve a net-zero economy, primary industries are also major emitters, including the steel (8% of global emissions), cement (c.3%) and chemical sectors (2.5% with CO_2 emissions being emitted also at the end-of-life of chemical products, for example in waste incinerators).[1]

Due to our continued reliance on industry's products it is crucial that we ensure that the sectors' contributions to the economy and to climate action are made in a net-zero compliant way. As such, we need to enable an effective and just transition that retains and builds on the sectors' economic value creation and aligns it with our emission reduction obligations. Though hard hit by the Covid-related economic crisis, it is imperative to keep industry and its product chains at home to ensure benefiting from them as growth resurges.

Closing domestic production simply to import carbon intensive replacements is not acceptable from a climate perspective nor expedient economically. The solution needs to be the development of a domestic net-zero industry. There are several pathways of producing low-carbon steel, cement and chemicals. All of these come at a cost and require new critical infrastructures. The needed technology, commercial and policy innovation to deliver these can, however, lay the foundations for a prosperous net-zero economy. At the end of the day, investing in the decarbonisation of primary industry is not mere climate policy, but industrial policy.

KEY ACTIONS FOR A NET-ZERO INDUSTRY

Economic opportunities from climate action need to be appreciated
Implementing net-zero climate action can become a vehicle for short term job creation and long-term sustainable economic growth.

Benefits need to be retained and a leakage of intellectual property prevented
Policy frameworks that drive innovation in primary industry are investments into the future. They need to ensure domestic job and value creation of climate technologies are realised and retained.

Framework conditions need to be provided
To give industry access to climate innovation government needs to enable and ensure low-carbon resources and infrastructures are made available without technology favouritism and with equal access.

Industry needs policy clarity, investment security and public-private partnerships
First mover action needs to be de-risked through public-private partnerships and a clear industry strategy that sees industry benefit from being net-zero compliant.

Costs need to be covered fairly
Cost for building and operating climate infrastructures as well as the cost of the low-carbon production need to be covered in the current absence of effective CO_2 pricing.

Net Zero requires a new institutional approach
The challenges of net zero are massive. To succeed requires a new institutional approach that ensures net zero is at the heart of policy making and action across the economy.

[1] Our World in Data (2020), *Emissions by sector*

2. General challenges: enabling and incentivising transformative change

CCS and Hydrogen are needed to complement critical Renewable Electricity

Primary industry as a major emitting sector poses a particularly difficult challenge for policies to reach net-zero. As emissions are generated both through intensive energy use and integral processes in the production operation, differences in manufacturing processes and requirements across and within the steel, cement and chemical industries mean that there is **no one-size-fits-all solution**.

There are three key challenges for industry that require action beyond direct electrification with renewable electricity: (i) Providing high temperature heat needed for many processes through hydrogen. (ii) Replacing current fossil carbon feedstocks and chemical reactants in the chemical and steel industry, which also requires hydrogen. (iii) Capturing and storing (CCS) process emissions from the cement industry that remain unabated even with a complete low-carbon energy use, as well as from waste incineration, and for example steel and ammonia plants in the absence of sufficient low-carbon energy carriers in the near- to medium-term.

To deeply decarbonise all industry in the near future therefore requires complementary use of renewable electricity, CCS and hydrogen that needs to be produced in a net-zero compliant way. Enabling clean hydrogen use at scale as early as possible is crucial to decrease the share of unabated natural gas in the system. Renewable electricity and CCS therefore take a particularly important role for enabling a net-zero industry, due to their complementary ability to scale net-zero compliant hydrogen production.

Hydrogen can be produced via electrolysis with renewable electricity (green hydrogen). However, in 2019, only about 38% of the UK's electricity generation was renewable, which means expanding renewable electricity generation to decarbonise electricity and enable hydrogen production needs to be an absolute priority.[2] Particularly in light of the sheer scale of required additional renewable electricity. A single steel mill producing some 5 million tonnes of steel a year would require more than all electricity consumed in Wales to run on hydrogen.[3] CCS can help scale a clean hydrogen supply for industry by capturing CO_2 from the reforming of natural gas (blue hydrogen) until sufficient additional renewable electricity is available. This twin track approach of supplying net-zero compliant hydrogen can prevent a continued unabated fossil gas use within a 'hydrogen-ready' industry.

Find out more

For more information on the different technologies needed for decarbonising industry and their associated challenges please refer to Bellona's **Industry Guide to Climate Action**

Retaining the value: Providing incentive and alleviating risk

CCS and hydrogen technologies are **infrastructure and therefore capital intensive**. Being first in eliminating CO_2 emissions from primary industry can be **a costly and risky endeavour** for as long as we lack sincerity around achieving the net-zero economy from policy makers. In the absence of an internalisation of CO_2 emissions into the price of a product, first movers will

[2] HMG (2020), *Digest of UK Energy Statistics (DUKES) 2020, Chapter 6*,

[3] Vogl et al. (2018), *Assessment of hydrogen direct reduction for fossil-free steelmaking*, Cleaner Production, 203, 1, 736-745

struggle to transfer these additional costs across the product chain. Government support and the development of business models are key.

However, such government spending and support also in direct support of industrial emitters should not be viewed in isolation. Investing in the **decarbonisation of primary industry is not mere climate policy, but industrial policy** that enables the retention and possible expansion of sectors from which we currently generate value for the wider economy. Indeed, each different path of addressing emissions from industry comes with its own set of wider economic consequences on jobs and value creation across product chains that need to be considered.

Find out more

For an example of state support and risk allocation for first-mover CCS projects, please refer to Bellona's Briefing on '**Norway's Longship CCS Project**', and for an outline of some of the economic benefits a CCS industry can generate, please refer to Bellona's Joint Paper with CEP '**Laying the Foundation for a Net Zero Society**'.

SOCIO ECONOMIC EFFECTS: THE EXAMPLE OF THE WELSH STEEL SECTOR AND PORT TALBOT

The steel sector in Wales has been a major employer and driver of economic activity in the region. It provides a particular high value employment both in terms of gross value added and salary, which is almost double the Welsh average. Any change to the current production of iron and steel products would have significant implications for the Welsh economy, and the UK's by extension.

At the heart of the Welsh steel sector stands TATA's Port Talbot integrated steel mill. In 2019, the plant verified about 6.4million tonnes of CO_2 under the EU ETS.[4] There are several decarbonisation options available (see Figure 1) including a replacement of primary with secondary steel production via the Electric Arc Furnace (EAF) route, or a decarbonised primary production route via hydrogen or CCS. Each choice has different socio-economic consequences.

Key factors	Continuation with current technology	Replacement of Blast furnaces with Electric Arc	Primary production decarbonisation (CCS or Hydrogen feedstocks)
Tata physical output kt steel, and resulting gross value-added (GVA)	↓	↓	↑
Tata Port Talbot and other company employment in Wales	↓	↓	↑
Indirect employment supported in Wales in supply chain and supported through wage spending	↓	↓	↑
Wales steel exports	↓	↓	↑
UK trade balance in iron and steel	↓	↓	↑
Production point carbon emissions – Wales	↓	↓	↓
Imported carbon emissions associated with Wales & UK steel consumption	↑	↑	↓

Figure 1: Scenario route for future steel making, from Munday & Turner (2020), Steel Manufacturing in Wales: Ensuring a Sustainable and Prosperous Future, p.6

Failing to decarbonise primary steel production would result in the loss of direct jobs, but also affect associated product chains. Remaining metal and steel manufacturing business will see a likely increase in cost due to the import dependence and associated vulnerability. A secondary steel production can only absorb some of these effects. The process itself is less labour intensive. Its climate benefits are fundamentally dependent on access to low-carbon electricity. Also, while secondary steel production is crucial for circularity and sustainability reasons, the process still requires low-carbon primary iron for chemical balancing and to producer higher steel grades. In the absence of a domestic primary production, this would likely affect the UK's trade balance, and could result in imported carbon emissions and to the exodus of manufacturing industries reliant on high-grade steel, such as the automotive sector.

In turn, while more capital intensive, a decarbonised primary steel production offers new business opportunities around high-grade low-carbon steel products that can support domestic product chains and export to countries without access to the technologies and resources for low-carbon primary steel production. Whether through CCS or hydrogen is a decision dependent on the operator and local conditions. In the case of Port Talbot, access to both solutions appears possible: through CO_2 shipping from South Wales to a CO_2 storage site in the Irish Sea, or transport of low-carbon hydrogen to South Wales.[5] As iron ore is already largely imported to the UK and other steel manufacturing locations across Europe, the particular need of hydrogen-based steel production for high-grade iron ore does not appear a deciding factor.

Ensuring the UK has both a growing secondary steel sector and a decarbonised primary steel production available domestically would likely result in wider economic benefits and ensure a fully net-zero compliant product chain in the UK. If primary steel at Port Talbot is to be part of the UK's net-zero economy, investment cycles dictate that a decision will have to be taken as soon as possible. CCS will be essential in this case, either for direct application or to support the hydrogen production.

Find out more

For more information on the economic importance and opportunities of clean primary steel production in Wales, please refer to CEP's Policy Brief '*Steel manufacturing in Wales: ensuring a sustainable and prosperous future*'.

[4] TATA, *Port Talbot*

[5] ETI (2017), *Taking Stock of UK CO2 Storage*

Reaping the Rewards: Why Being First Matters

Climate leadership and pioneering is generally rare due to its associated risks and costs. These apply not just in case of potential failure, but when being successful. There are, however, two key reasons that make 'being first' an imperative, particularly for the UK and Europe. One related to our shared responsibility, and the other to the prosperity of our society.

Firstly, the UK has committed to net zero, and must act to deliver this, leading by example.

Secondly, for Europe and the UK to build their future prosperity, the adaptation of its economy and energy system to the requirements of a net-zero economy are critical. Driving the expansion of renewable electricity and providing the crucial climate infrastructures that are needed to sustain a net-zero economy as soon as possible can avoid the risk of an exodus of industry and value creation towards more favourable regions for production. In turn, within appropriate policy frameworks, new opportunities associated with new markets and product chains can rekindle industrial production at home, and with it bring additional value and job creation.

Focusing on industrial clusters eases many of the infrastructural challenges of decarbonising primary industry. Developing, for example, a CO_2 network around clustered point sources linked to intermediate storage hubs that connect to final storage locations offshore, reduces risks, costs and gives access to benefits from economies of scale. Transport and storage has large economies of scale, for example because larger pipelines are much cheaper per tonne of CO_2 transported. Capturing from a cluster of industrial emitters, including gas reformers, also reduces the length of pipelines. There may also be economies from planning processes from having a number of projects in the same areas.

Fair and equal access to climate infrastructures is key

As the operator of each link in the hydrogen and CCS chain is likely a separate entity, coordination of scale and timelines, for example through government agency, is essential to minimise cross-party risks. As industry invests into a capture unit, access to suitable transport and storage needs to be guaranteed. Similarly, sufficient amounts of low-carbon hydrogen need to be made available to justify investments in new hydrogen processes. For hydrogen this links to all components of decarbonisation: additional renewable electricity, electrolysis capacity and access to gas reforming and CCS. Since first mover industry will also fundamentally depend on services of a limited number of suppliers, monopolistic price pressures need to be avoided.

The challenges surrounding the provision of climate infrastructures raise questions over their initial ownership and risk allocation between the public and private sector, as well as the possible need for new institutional agency for oversight and other regulatory purposes.

Find out more

For more information on cross-party risks and the need for an institutional framework for coordination and oversight, please refer to Bellona's 'Manufacturing our Future'.

3. Particular Advantages: A UK leadership & economic opportunity

The above challenges affect every economy embarking on a net-zero transformation. Yet, the UK is in a comparatively advantageous position. This is owed to several intrinsic conditions as well as opportunities that have arisen due to the socio-economic and political environment of the UK.

Offshore renewable potential in the UK is the largest in Europe at about 5,000 TWh/year, more than ten times the current annual electricity consumption.[6] Renewable electricity – and particularly the offshore wind sector – will be critical to decarbonise electricity grids, road transport and scale green hydrogen production. As Figure 2 shows, the UK is one of the few European countries where the overall renewable potential exceeds its estimated demand even after accounting for full electrification of its current industry.

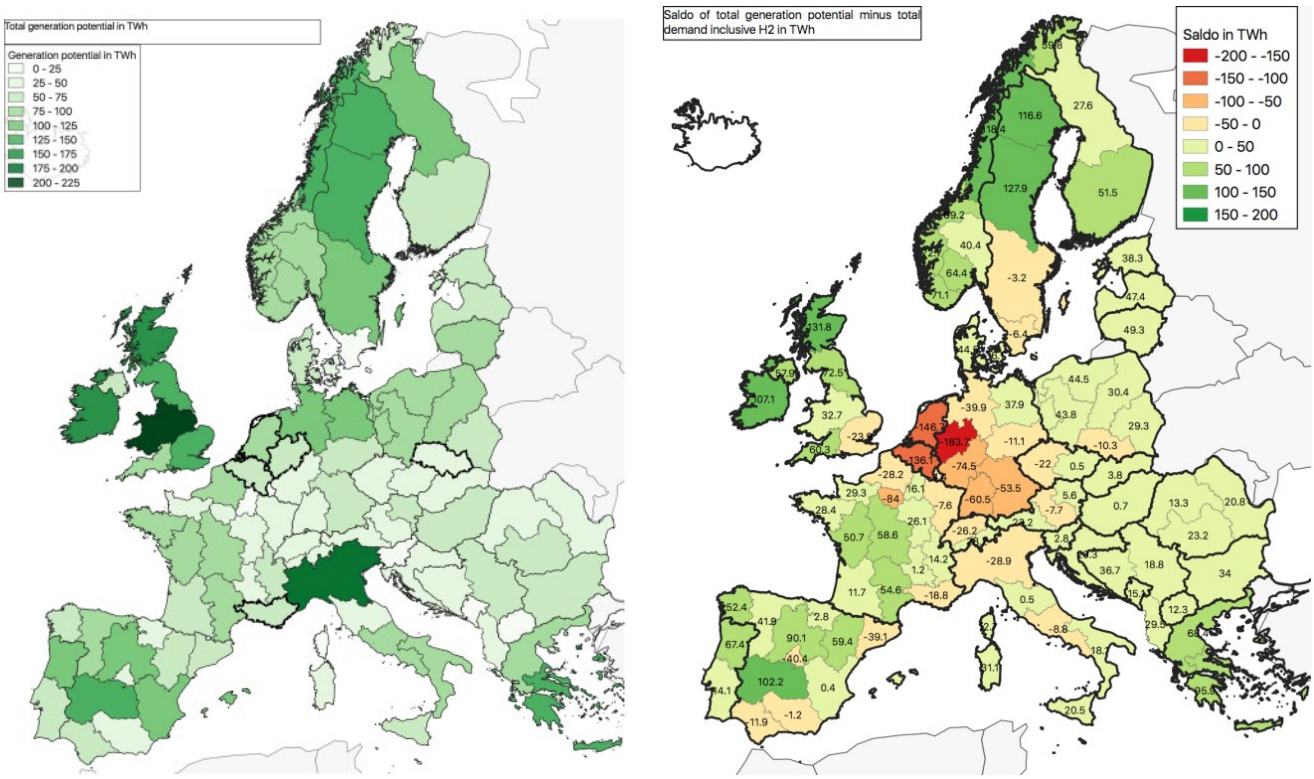


Figure 2: EU map for total renewable electricity generation potential compared with estimated demand including green hydrogen. Source: Wuppertal Institute (2020), Infrastructure needs for deep decarbonisation of heavy industries in Europe

These circumstances could make the UK an attractive low-carbon industry location with associated influx of job and value creation. It could also enable the UK to become an important exporter of low-carbon climate solutions and products for other European nations, particularly when considering energy demand of Europe's major industry regions in Germany, France, Belgium and the Netherlands.

[6] Wind Europe (2017), *Unleashing Europe's offshore wind potential. A new resource assessment*,

At the same time, the **UK also has a competitive advantage in CCS,** with Europe's second largest storage potential in the North Sea (compare Figure 3).[7] Additional storage opportunities exist in the Irish Sea. The available technical expertise due to the UK's existing oil and gas sector and the possible reuse of infrastructures could create comparatively low-cost paths towards a low-carbon industry and hydrogen economy. UK leadership on CCS could set the pace for European decarbonisation efforts by directly enabling others to follow the UK's example by offering, for example, CO_2 storage to industrial countries currently without a domestic access of their own, e.g. Germany.

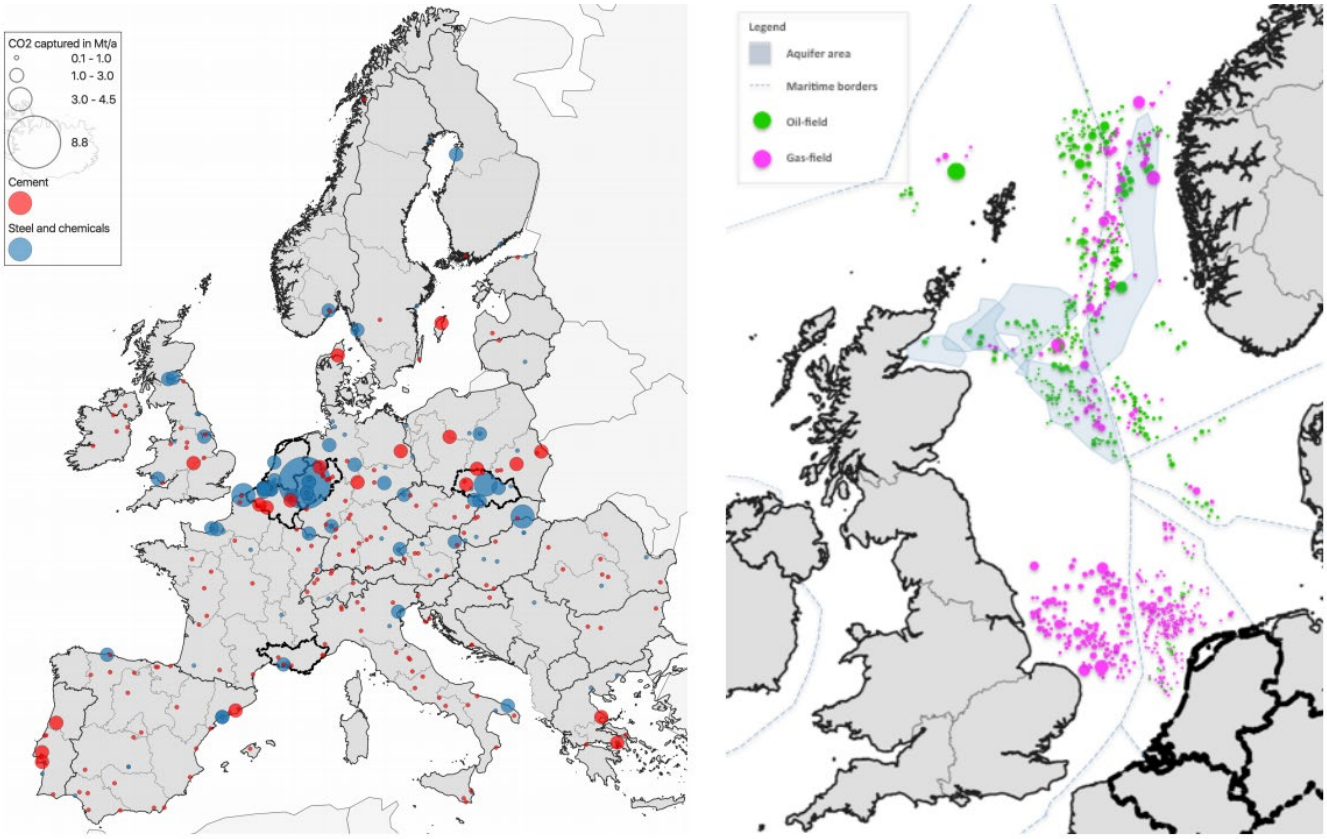


Figure 3: Possible CO_2 captured from EU industrial emission points and North Sea storage potential per country. Source: Wuppertal Institute (2020), Infrastructure needs for deep decarbonisation of heavy industries in Europe

All **major industry clusters are located in close proximity to the coast, easing access to both offshore wind electricity, hydrogen and CO_2 storage**. The particular locations of major industry clusters also allow for flexible ship transport of CO_2 and low-carbon energy carriers. This enables more extensive links also between distinct clusters, seen in the example of Humber and Teeside that share a joint CO_2 storage, or South Wales and the North West cluster who can similarly cooperate on storage and hydrogen production. Flexible shipping also could reduce the initial need for more capital intensive and less flexible pipeline networks.

Policy-wise, as the first major economy with a net-zero target enshrined into law, the UK has already seen its effects on policy measures being weighed against this target, e.g. in the Heathrow ruling in early 2020.[8] Realising the implications of a net-zero target for all parts of

[7] Acatech (2018), *CCU and CCS – Building Blocks for Climate Protection in Industry. Analysis, Options and Recommendations*

[8] Climate Change News (2020), *UK's Heathrow airport expansion ruled unlawful over climate change*,

the economy through the advice of the Committee on Climate Change (CCC) also provides the UK with a unique country-specific evidence-base for action, absent in most other policy environments.

CCS PROJECTS

- Scotland's ACORN project that is linked to the Grangemouth cluster was awarded carbon storage license approval by the UK Oil and Gas Authority in December 2018. By reusing existing gas pipelines, the project could set the benchmark for low cost CCS and blue hydrogen production with the final investment decision expected by end of 2021 and operations to begin as early as 2023.[9]

- The Northern Endurance Partnership involving a consortium of BP, Eni, Equinor, Shell, Total and National Grid was announced in October 2020, developing the New Endurance storage site that is set to serve both the Humber (ZCH) and Teeside (NZT) clusters and could address half of the UK's industrial emissions.[10]

- The North West Cluster is seeing positive momentum around developing its CCS and twin-track hydrogen production path that could be operational by 2026 and prove crucial also for decarbonising the South Wales Cluster.[11]

Developing infrastructure can develop economies of scale quickly, thus reducing costs and creating competitive advantage. Recent announcements on the goal to support 4 industrial CCS clusters by 2030 paired with a CO_2 storage target of 10Mt per annum (mtpa) by 2030 capitalise on these benefits. Indeed, the UK boasts several of the most advanced CO_2 transport and storage projects in the world which could be several storage locations coming online over the next decade, giving the UK an edge on providing access to the world's first industrial decarbonisation network. Early projects will lead to improvements in technology. They will also help develop a skilled workforce which can deliver future projects.

[9] NS Energy, *Acorn Carbon Capture and Storage Project, Scotland*,
[10] Offshore Engineer (2020), *BP Leads New UK North Sea CCS Consortium*,
[11] The Business Desk (2020), *The case for a pioneering Merseyside carbon capture operation*,

BUILDING INDIGENOUS SKILLS AND INDUSTRY

Maximising the wider economic benefits from implementing climate technologies requires the creation of associated indigenous skills and industry. This has been a point of criticism when evaluating the UK's success in building up offshore wind capacity. Policy had not captured the full potential of attracting manufacturing of such wind farms to the UK, particularly in synergy with other industries.[12] Efforts have since been made to remedy this, for example through the government's wind industry sector deal,[13] though Brexit uncertainties have also prevented some manufacturing investments.[14]

One approach to ensure higher domestic economic benefits from production are realised is local content requirements (LCR). LCRs require a minimum share of input to be manufactured 'locally'. This can slow initial development until sufficient domestic product chains are available, as seen in the case of Brazil, which had an LCR of 60% on wind power developments until 2013 (now 80%). Parallel low-interest loans however attracted a number of international manufacturers in the 2000s, such as Danish Vestas, which since have made Brazil the number-one manufacturer of renewable electricity equipment in South America.[15]

Another option is to link project tenders with contributing to the local economy. In Portuguese renewable electricity tenders in the 2000s, the evaluation criterion on the 'creation of an industrial cluster' per tender was weighted 45% towards the final decision.[16] The criterion evaluated direct and indirect investment volume, direct and indirect employment generation, gross value added and sustainability of the project. While the approach ensured the renewable sector was contributing jobs and growth, it meant that cost-efficiency contributed only marginally to the final decision.[17] Renewable electricity costs may have been higher as a result, but assumed to be outweighed by the wider economic benefits.

There are risks to guard against

Despite the advantages and opportunities, challenges remain. Investments may be insufficient. The government has announced one billion pounds of funding for CCS. However, this falls well short of the sums that will be needed to realise its goal of 10 mtpa of captured CO_2 by 2030. Additional funds and/or other forms of support will be required.

There may also be delays to projects due to barriers or risks encountered during development. Among the largest of these is the challenge of co-ordination across parts of the CCS chain. Government and regulatory authorities are likely to need to play a major role here.

The implementation of first of a kind climate technology could see UK customers disproportionately affected by associated costs. There is also the possibility that rather than developing skills, supply chains and commercial opportunities for export many of the benefits flow to other countries. As an example, while the German 'Energiewende' was key in bringing down costs and increasing efficiency of renewables, these benefits are still paid for by German consumers through one of the highest electricity prices in the world. To make matters worse, the

[12] Chinn (2014), *The UK Offshore Wind Supply Chain: A Review of Opportunities and Barriers*,
[13] BEIS (2020), *Offshore wind Sector Deal*,
[14] The Guardian (2016), *Siemens freezes new UK wind power investment following Brexit vote*,
[15] Fraunhofer, (2015), *The International Transfer of Wind Power Technology to Brazil and China*,
[16] Aures (2016), *Auctions for Renewable Energy Support in Portugal: Instruments and lessons learnt*
[17] Andreas et al. (2019), *Portugal under austerity: from financial to renewable crisis?*

economic opportunities that gave rise to new innovative industries were only partially retained in Germany. Several German solar PV companies were unable to compete with growing Chinese competition and declared bankruptcy between 2011 and 2013 before anti-dumping duties were imposed against Chinese products at an EU level.

Similarly, upscaling from pilot projects financed through European taxpayer money could take place outside Europe for cost reasons and market growth potentials. This has been feared, for example with TATA's Hisarna steel technology that has been piloted in the Netherlands but is now planned to be upscaled in India, with a commercial plant promised to be built in the Netherlands only afterwards.[18]

Any economic benefits may be transitory or low grade. For example, if jobs created are relatively low skill and – short-lived, for example during construction jobs only, they may fail to generate sustained benefits.

3. What is needed now?

Ensuring a just and net-zero transition for primary industry requires capitalising on the UK's advantages and providing effective policy frameworks that align pace and scale of climate action with generating economic opportunities that benefit all. The UK is well-positioned in addressing and overcoming the most fundamental challenges all countries transitioning towards net-zero are facing. Indeed, with the fundamental vision and objective in place, it is now about evaluating, identifying and then implementing the most effective policy tools to achieve a net-zero economy with a low-carbon primary industry at its heart.

Economic opportunities from climate action need to be appreciated

Implementing net-zero climate action can become a vehicle for short term job creation and long-term sustainable growth, as shown in a Joint Paper by Bellona and CEP earlier this year.[19] Economic benefits include those that arise from climate action in one sector on another, e.g. construction sector jobs and disposable income gains through energy efficiency improvements in the housing sector. Crucially, the implications on product chains and therefore economic value and job creation of climate action in industry, or the lack thereof, need to be properly evaluated. This especially in light of resulting trade dynamics in the wake of Brexit as well as associated opportunities that have to be part of a forward-looking climate and industry policy.

Benefits need to be retained and a leakage of intellectual property prevented

Policy frameworks that drive innovation in primary industry are investments into the future. Through the right policy, they can generate domestic opportunities for job and value creation including but not limited to the product chains of climate technologies. Mechanisms to safeguard domestic value creation may also be needed due to unfair international competition. As seen in the mentioned examples, such measures can lead to a slower implementation and higher cost. Yet, as the opposite – a fastening pace and lowering of costs – is imperative for a net-zero industry transition, the UK needs to properly evaluate the policy mechanism with which to implement climate infrastructures to create both sustainable environmental and wider socio-economic benefits.

[18] The Hindu Businessline (2020), *Green steel: Tata Steel develops climate-friendly method of production*
[19] Bellona & CEP, 2020, Joint Papter: *Laying the Foundations for a Net-Zero Society*,

Framework conditions need to be provided

As the provision of key climate technologies – renewable electricity, CCS, and hydrogen – lies beyond the remits of industry, it is down to the government to enable and ensure resources and infrastructures are made available. Yet, policy support needs to address the complexity and specificity of different climate technology paths that are available in an open and competitive way without technology favouritism. Providing optionality of 'low-regret measures' is key to ensuring that the most effective path in terms of cost, climate abatement and macroeconomic consequences to net-zero is taken. Lock-ins due to sunk cost into fossil infrastructures need to be avoided. The provision of adequate resources (hydrogen, electricity) and infrastructures (CO_2 and H2 pipelines) with equal and fair access need to be the key objective of the government in support of facilitating the net-zero transition. Any hydrogen production needs to be net-zero compliant, i.e. low-carbon.

Industry needs policy clarity, investment security and public-private partnerships

The new 4-cluster ambition is already an improvement over the previous sequential approach yet may still be insufficient to boost innovation and implementation at scale and pace needed to reach net-zero. Using the economic recovery and net-zero legislation as an opportunity to increase government ambition and support multiple zero-carbon clusters simultaneously in their transition to net-zero has given a strong climate political signal ahead of COP 26. For it to generate the desired new economic impetus to the UK industrial sector, clearer frameworks need to be provided that show government's sincerity and deliver investment security.

Comprehensive sector deals for the primary industry could help ensure the continuation of primary material production in the UK by simultaneously providing the vision and certainty to boost productivity, employment, and skills through public-private partnerships on climate innovation as part of the net-zero transition. Providing clear targets, lines of support and commercial opportunity for a UK industry will be key to generate investments into the UK business place.

Costs need to be covered fairly

Cost for building and operating crucial infrastructures as well as the cost of the low-carbon production need to be covered in the current absence of effective CO_2 pricing. There is a range of policy instruments that need to be evaluated to prevent undue competitive disadvantage of clean products and incentivise the provision of climate solutions, such as CCS. Capital grants, tax breaks, reserve markets and ways of risk absorption are important considerations for the implementation of climate infrastructures. Similarly, product standards, quotas or pricing mechanism, such as Carbon Contracts for Difference (CCfD) and Carbon Border Cost Adjustments (BCA) need to be evaluated for the low-carbon product market

Net Zero requires a new institutional approach

As shown through these required actions, achieving net-zero is the greatest challenge of our time and requires a full system approach. Policy that evaluates needs of emitting sectors in isolation could endanger the transition as a whole. Awareness over short-term scarcity of low-carbon resources (e.g. low-carbon hydrogen) as well as long-term demands that require an oversizing of infrastructure today will be essential for an effective and just climate and economic policy. It is questionable that the current institutional framework of government is fit to address this challenge. Instead, a dedicated net-zero agency that streamlines policy across government towards the goal of net-zero may be needed. Such an institutional body could also take over the crucial tasks of creating markets for CO_2, hydrogen and low-carbon products.

Related Publications

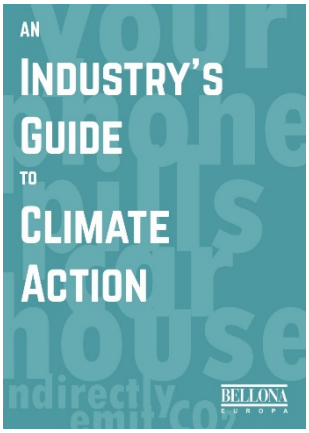
Norway's Longship CCS Project (October 2020)

In this briefing we describe the Norwegian CCS project "Longship" giving an overview of the project and the stages of its CCS chain. The project is receiving Norwegian Government funding, hence we further analyse financial risks and estimated project costs. Finally, we calculate cost per tonnes of avoided CO2 within the premises of the Longship project and its contribution to climate mitigation.

Laying the Foundation for a Net Zero Society (June 2020)

In partnership with: Centre of Energy Policy at the University of Strathclyde (CEP)

The paper conducts an analytical economic review of three net zero actions: enabling and progressing the realisation of residential energy efficiency gains the electric vehicles rollout, investing in carbon capture and storage capacity.



Industry Guide to Climate Action (November 2018)

The guide outlines how heavy industry and the regions that host them must take up their fair share of responsibilities in moving towards a low-carbon economy. The report highlights technologies, which already exist and are in development, possible to be deployed for industries to cut down on emissions whilst keeping their competitive advantage.

BELLONA

Further information

Dr. Jan-Justus Andreas
Senior Policy Manager Industry/ Head of UK Programmes
justus@bellona.org

Daniela De Lorenzo
Communication Manager
daniela@bellona.org

Bellona
Vulkan 11
0178 Oslo
Norway
www.bellona.org