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Local Low Carbon Industrial Strategy

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SUMMARY

Local Enterprise Partnerships and Mayoral Authorities across England are in the process of developing Local Industrial Strategies, reflecting the new focus of the UK Government. At the same time, a rapidly growing number of Local and Regional Authorities are declaring Climate Emergencies. This briefing note discusses the use of industrial strategy as a tool to respond to the climate emergency, based on conceptual and case study research on low-carbon industrial strategies in the Centre for Climate Change Economics and Policy.

The right framing for industrial strategies is crucial. Decarbonising regional economies requires deliberate structural change, directing economic activity towards the development of low carbon infrastructure and transforming or sunsetting high carbon industries. Focusing only on productivity or economic rebalancing is not enough. A successful local low-carbon industrial strategy should incorporate: a place-based approach where the distinctive strengths of each part of the region are recognised and no communities are left behind; clear missions to sunset high-carbon activities as well as drive innovation in low-carbon; and the institutional capacity to support these approaches and build coalitions for action.

KEY MESSAGES

- **A mission-oriented approach to local low-carbon industrial strategies must balance innovation support with sunsetting of high-carbon industries.** Strategies that support innovation and growth in low-carbon industries do not generally achieve carbon emission reductions. Strategies to address high carbon industries are also needed.
- **A place-based approach to local industrial strategies should embed the principles of a 'Just Transition'.** Low carbon industrial transformations will necessarily disrupt existing industries, sometimes in areas with high levels of deprivation. These areas will need specific support if they are not to be left further behind.
- **Institutional capacity to support the implementation of local low carbon industrial strategies must be deliberately created.** Various forms of intermediary organisations can play an important role in a low-carbon transformation of the economy.

Local Enterprise Partnerships (LEPs) and Mayoral Combined Authorities are now producing Local Industrial Strategies, which will play a central role in LEPs' strategy frameworks as they will determine priorities for future local growth funding and the Shared Prosperity Fund (the proposed replacement for EU Structural Funds lost post-Brexit).

Since the launch of the Industrial Strategy, the UK Government has also reaffirmed and strengthened its commitment to tackling climate change with an amendment to the 2008 Climate Change Act to set a net-zero emissions target for 2050. The adoption of this net-zero target followed a recommendation from the Committee on Climate Change (2019) to align UK law with the Paris Agreement ambition of limiting global temperature change to 1.5°C.

This Briefing Note presents a set of recommendations for the orientation of these Local Industrial Strategies, in particular how they can contribute to a low carbon transformation of regional economies. Our recommendations are based on the findings of case study research on the emergence of low-carbon and green industry clusters in the regions of Styria, Austria and the Humber region in the UK.

Introduction

In November 2017, the UK Government published a new Industrial Strategy and positioned this as a key policy priority. This strategy heralds a more active and deliberate role for government in the UK's industrial development (HM Government, 2017). All

The Purpose of Local Low Carbon Industrial Strategies

For industrial strategies to contribute to a 'Clean Growth' agenda with decarbonisation of the economy, decarbonisation must form a core purpose and serve as an organising principle for other activities. Industrial strategies are a framework to stimulate economic activities and promote structural change (Rodrik, 2008). The structural change, in this common conception, is intended to direct economic activity towards sectors with the best prospects for innovation and productivity gains. Low carbon industrial strategies incorporate a goal of directing economic activity towards sectors that contribute to decarbonising the economy and the construction of low-carbon infrastructure systems.

The purpose of Low Carbon Industrial Strategies (or LCIS) is therefore largely compatible with a conventional 'structural change' framing, but with some important additions (Busch et al., 2018):

- Clean Growth aligned missions that target *sunsetting¹ of fossil fuel technologies and carbon intensive products and processes* alongside *sunrising² of renewable technologies and circular economy activities*.
 - Action to target energy demand reduction, alongside decarbonising supply.
 - Designing deep and systemic change, from changes in consumption through to work practices and corporate governance, that results from the shift away from carbon intensive growth.
 - Stimulating investment dedicated to low carbon infrastructure.
- Embedding experimental learning approaches in governance, so strategies are designed with evaluation from the outset and processes for regular review and adaptation are included.

The current framing of the UK Industrial Strategy is not yet completely reconciled with a 'Clean Growth' agenda. It is intended to address two issues that are seen as holding back the UK economy, but which stand in tension with each other and with the net-zero carbon targets recently adopted by government. The two issues are:

1. **Productivity:** The UK lags behind other G7 nations in productivity statistics, and productivity growth has stalled (ONS, 2016). This priority is reflected in the industrial strategy framing around "Five Foundations of Productivity", these being: Ideas, People, Infrastructure, Business Environment and Place.
2. **Rebalancing the economy:** The Brexit referendum vote in some ways demonstrated the impact of the gaps in economic performance that exist between regions of the UK; disparities which are the highest in Europe (McCann, 2018). The need to rebalance the economy was a prominent feature of the political justification for the industrial strategy, and is reflected in "Place" being identified as one of the Foundations of Productivity.

A strategy that focuses on boosting further the productivity and international competitiveness of existing industry strengths risks exacerbating economic imbalances between regions of the UK. Whilst the development of local industrial strategies may address regional imbalances, several other initiatives build on existing strengths in already prosperous areas, hence reinforcing existing inequalities.

¹ Sunsetting policies are targeted at phasing out the use of high carbon technologies and protecting workers and communities likely to be affected by the decline of associated industries. An example is the application of CO2 emissions limits on coal in the UK to effect a phase-out of unabated coal power.

² Sunrising policies are those that support the use of new technologies and growth of new industries, such as feed-in tariffs for solar PV or guaranteed strike-prices for Offshore Wind power.

Purely focusing on industry growth also neglects the important issue of sunsetting high-carbon technologies (Green and Denniss, 2018). This risks not addressing the lock-in effects that can block effective transitions, such as the networks of influence and lobbying between policy makers and fossil fuel industries (Seto et al., 2016). It also risks failing to plan for the negative social and economic consequences of potential industrial decline.

Box 1: Grand Challenges and the Clean Growth Strategy

The UK Industrial Strategy has identified four Grand Challenges, reflecting trends that are expected to transform the global economy:

- **Artificial Intelligence and Data:** general purpose technologies that are already transforming industries and business models across a wide variety of sectors.
- **Ageing Society:** the required innovations in products and services to meet the needs of ageing populations.
- **Clean Growth:** the transition to a low-carbon global economy will transform products, services and business model across all sectors.
- **Future Mobility:** innovations in self-driving vehicles and zero-carbon technologies are set to revolutionise how people, goods and services are moved around towns, cities and the countryside.

Local Industrial Strategies are expected to address some of these Grand Challenges on the basis of existing industry strengths.

The Clean Growth Grand Challenge is closely aligned with the Clean Growth Strategy, which aims to decarbonise the UK economy whilst boosting economic growth.

Mission-oriented strategies for innovation and industry sunsetting

The national industrial strategy has an explicit *mission-oriented* approach, where the role of the state is to direct innovation towards addressing grand societal challenges – setting missions to be

accomplished. The state then supports the development of appropriate innovation ecosystems, funds research and development, creates and shapes markets, and appropriates some of the returns of market success (Mazzucato, 2016).

Local industrial strategies would benefit from alignment with this approach, identifying complementary missions tailored to the competencies of regional and local government. As part of the evidence base for Greater Manchester's (GM) Local Industrial Strategy, Mazzucato et al. (2019) suggest such an approach, with a potential mission of:

"Carbon neutral living within the Greater Manchester economy by 2038"

This citizen-centred mission is intended as a base from which specific projects can be derived for the different spheres of "living": education, household consumption, the home, commuting, leisure, etc.

Box 2: Green Tech and the Low Carbon Economy in Styria

Styria, one of Austria's nine regions, is home to an award winning Green Tech Cluster. A cluster organisation that is owned by the regional state, the City of Graz and local industry partners, and has a membership of over 200 companies. The success of this cluster is the result of a functional innovation ecosystem, with particular strengths in the translation of university research into industry innovation and entrepreneurship.

The growth of low-carbon technology companies, however, has not led to a decarbonisation of the Austrian economy. Greenhouse gas emissions were 3% higher in 2016 than in 1990 (Eurostat, 2018). A vibrant innovation ecosystem for low-carbon technologies has not translated into absolute carbon emission reductions. This is a further policy challenge that requires an additional set of policy tools.

Amongst the specific projects and activities needed to achieve a clean growth mission are some that address the sunsetting of high-carbon industries. Our research on Green Industry development in Styria, Austria (see Box 2) highlights that sunrising

alone does not create a low-carbon economy – complementary sunset strategies are, however, currently lacking.

At national and state levels, policies that limit the production of fossil fuels are beginning to be used (Erickson et al., 2018). This is a somewhat new turn for climate policy, which has previously focused on interventions on fossil fuel consumption and carbon emissions, such as emissions trading schemes and incentives for electric vehicles. Given appropriate planning and regulatory powers, regional and local authorities could similarly prevent the production and processing of fossil fuels. If aligned with a Just Transition programme that facilitates job-to-job transitions for affected workers, this approach could find strong support amongst a public mobilised by ongoing climate strikes.

Industrial Strategies for a Just Transition

Just Transition³ principles provide a strong basis for industrial strategies that ‘rebalance the economy’ whilst decarbonising it. A place-based approach, recognising the distinctive characteristics of areas, can formulate policies that ensure no communities are left behind by structural change. The skill level of the resident population, the types of industry present, the presence of key anchor institutions such as Universities or large OEMs, and less tangible cultural and heritage characteristics, all determine the impact of transitions on workers and communities. In the UK, these characteristics can vary significantly between and within LEP areas.

A Just Transition-based strategy must understand local characteristics, answering questions such as:

1. What industries and occupations in this area are threatened by a low carbon transition?
2. What industries and occupations are likely to grow as a result of a low carbon transition?
3. What scope exists for retaining and redirecting local/regional strengths (including skills,

³ The principles of a Just Transition, initially promoted by Trade Unions (Rosemberg, 2010), require consideration of the social implications of low-carbon transitions, with

practice communities, business and R&D networks, etc.)?



Figure 1: The Science Tower in Graz, Austria. A Lighthouse project that demonstrates many of the green technologies developed in the region, and is home to the Green Tech Cluster organisation.

Our research in the Humber Region has shown the importance of recognising latent capabilities, and their absence, for the development of new, low carbon industries. The manufacturing of wind turbine blades, and operations and maintenance services for offshore wind farms, can build on existing manufacturing and fossil fuel industry capacities. But high-value manufacturing of turbine nacelles (the housing for the turbine and associated equipment) requires a different skills base and has therefore not been established in the Humber.

the impact on workers, communities and citizens (Robins et al., 2019).

Box 3: From Fossil Fuels to Hydrogen in the Leeds City Region

The Leeds City Region has existing strengths in high value manufacturing in the oil and gas industry supply chain. The impacts of a potential decline of these industries could be addressed, in line with Just Transition principles, by facilitating re-skilling and re-tooling to an emerging hydrogen economy, particularly if low carbon hydrogen production could be developed. The skills and technologies required appear similar enough for this to be possible.

Northern Gas Networks (NGN), in collaboration with local authorities, have proposed a pilot project to convert the natural gas network of the city of Leeds to carry hydrogen. Hydrogen could be sourced from excess generation of offshore wind turbines or from natural gas with carbon capture and storage. The environmental benefits of such a scheme could include the decarbonisation at point of use of domestic and commercial heating, and a low carbon fuel for energy intensive industry processes. The Just Transition implications of this project should be included in its planning.

On a regional scale, Robins et al. (2019) have shown that there are several areas in Yorkshire that currently have high levels of social deprivation and a high exposure to jobs that require re-skilling for a green transition. These areas would benefit from industrial strategy interventions to provide on-the-job skills training to improve their resilience to a changing labour market. Areas that are more affluent, and have industries likely to see jobs growth from a green transition, would benefit from very different interventions, likely more focused on enhancing R&D investments and knowledge transfer activities – the hydrogen economy is a possible example of this (see Box 3).

Institutional Capacity and Intermediaries

The just transition and mission-oriented framing for local low carbon industrial strategies have an active role for the local state in the economy. After a decade of austerity, local and regional authorities

do not have the capacity to carry out this role on their own. Instead they must play a coordinating role, working in partnership with regional anchor institutions and intermediaries to implement missions (including evaluating the impacts of industrial strategy action) and highlighting risks and inequalities to help to ensure just outcomes for all communities.

Our research in Styria and the Humber Region show a potentially fruitful approach to developing intermediary capacities – the redirection or extension of existing institutions to support low carbon industries. There are usually existing intermediaries in regions that serve older industries, sometimes fossil fuel industries. In the Styrian example, the frameworks and institutions created to support older clusters (the first was for the automotive industry) were adapted to support the creation of the Green Tech Cluster. In the Humber Region, many of the skills and expertise of the existing chemicals and offshore oil and gas industries are useful for offshore renewables. As a consequence, intermediaries that were previously focused on these industries have begun to reorient themselves to support the newly emerging offshore renewables industry, exploiting their existing institutional infrastructure in the process (see Box 4).

A growing body of academic research highlights the importance of intermediary organisations capable of carrying out functions that are crucial for innovation ecosystems (Kivimaa et al., 2019). Different types of intermediaries are instrumental in the establishment and maintenance of industry clusters, by carrying out a set of functions that support: entrepreneurship, research & development, knowledge exchange networks, business networks, market and innovation intelligence, mobilisation of financial resources and social and political legitimisation. Creating organisations capable of carrying out such functions is a process that requires resources and time – repurposing existing institutional capacities, including existing networks, may shortcut this.

Box 4: Offshore Wind in the Humber Region

In January 2017, Siemens began producing offshore-wind turbine blades in Hull, for turbines to be installed off the east coast of England. This event marked an important milestone in the process of creating a new offshore renewables industry cluster in the Humber region. The decision to build a new factory in Hull was made both because of the suitability of the existing port infrastructure, and because of the actions of key stakeholders including the UK Government and local authorities (University of Hull Logistics Institute, 2017). The development of a cluster around this key investment has been mixed: operations and maintenance industries have grown significantly but further turbine manufacturing has not followed.

Elements of the innovation ecosystem around the Humber Estuary are interesting. Intermediaries have taken on roles in internationalisation, skills training, supply chain network brokering and legitimisation. HCF Catch is a membership organisation that provides skills training and industry networking services. Originally set up for, and by, the chemicals and processing industries, HCF Catch is now actively reorienting towards the offshore renewables sector.

Conclusions

Local industrial strategies can be an important tool for the low-carbon transformation of local economies. Examples of successes and shortcomings of low-carbon industrial development initiatives in Styria, Austria, and the Leeds City Region and Humber regions in the UK, highlight important design considerations for industrial strategies if their transformative potential is to be realised:

1. The *purpose of local industrial strategies should be framed as structural change towards decarbonised industries and activities*, with mission-oriented approaches that recognise the importance of an active government role. Missions should include projects and activities

that also focus on sunsetting of high carbon activities, not just sunrise of green tech.

2. The necessary decline of high-carbon industries require a place-based approach that ensures the transition is fair for all communities in the region.
3. Institutional infrastructure, often in the form of intermediary organisations, is important and can be reoriented or extended from existing industries.



Figure 2: The Humber Region aims to support an offshore wind sector that seeks to deliver 30GW of capacity by 2030, with the world's largest offshore wind farm (Hornsea One) currently under construction.

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