

Climate Innovation Insights offers a platform for reflections and lessons from renowned climate innovation experts to spark discussion about the process of tackling climate change through innovation. The independent opinion pieces discuss best practices, different methodological approaches towards climate innovation and implications for business, society and politics. The series is supported by Climate-KIC, Europe's largest public-private climate innovation partnership.



Adapting Industrial Clusters for Climate Innovation: A Guide for Public Intervention

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Key messages

- Policies for climate innovation clusters need to map the economic and social fabric of climate innovations; this requires new approaches for identifying clusters.
- Cluster policies should address how climate innovations can diffuse within existing manufacturing clusters, and support low-carbon models.
- Policies should also address both the supply-side and the demand-side factors that drive climate innovation.
- Further, they must address business framework conditions sufficiently, in order to make a difference in scaling up climate innovation ventures.
- Cities play a key role in the transition towards a low-carbon economy and provide a focal point for change, because of their diverse, multi-sectoral nature.

Introduction

Technologies and new business models to combat climate change are being developed daily, in places that have put tackling rising temperatures and environmental pollution high on their political agendas. Certain cities and regions are emerging as knowledge hot spots for 'cleantech' and low-carbon developments, while universities, knowledge institutes, cities and companies have joined forces to protect the environment.

These clusters are found in many places. In the Netherlands, Delft, Rotterdam and the Drechtsteden have

formed the Clean Tech Delta,¹ while the Cleantech Cluster Region Ghent² was recently established to act on climate change challenges in the Flanders region of Belgium.

The question is: how best to support and stimulate the formation and growth of innovation clusters directed at fighting climate change? This is important for identifying successful public interventions. But is this the right question for policymakers? Is the nature of the clustering processes sufficiently understood to achieve a critical mass of clean industrial operation? Are policymakers clear about their vision of developing cleantech 'valleys' in Europe?

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Box 1. What are cluster policies?

The recent Smart Cluster Policy Guide³ suggests that cluster policies are “an expression of political commitment and ... a set of specific government policy interventions aiming at strengthening existing clusters or facilitating the emergence of new ones”. They can be regarded as framework policies that support entrepreneurial and innovation dynamics in related industrial areas.

The emphasis is much more on the ability of cluster policymakers to create a favourable business ecosystem, rather than supporting networking and cluster management organisations only.

Some of the framework conditions needed for effective cluster policies are similar across all types of climate innovation. These include the knowledge base, supportive financial mechanisms and developing the skills of entrepreneurs. Others are specific to a particular area; for example, infrastructure is crucial for the adoption of electric vehicles, while building incentives are needed for renewable construction.

This *Insight* seeks to answer some of these questions and looks at what policymakers need to do to create and sustain climate innovation clusters.

Understand and map climate innovation clusters

Understanding climate innovation clusters and the nature of clustering processes is the first step towards finding the most promising and effective policy interventions. It is not only important to understand the functioning of favourable ecosystems for cleantech innovation, and how this differs from the functioning of clusters for other emerging businesses. But it is also necessary to understand the factors that can shift existing manufacturing clusters towards climate-conscious and sustainable production.

Cleantech businesses tend to cluster in similar places. They are influenced by the same laws that determine the concentration patterns of any other economic or social activity. Dynamic cooperation and competition are common ingredients that drive the development of clusters, but the actors needed to have an impact on countering climate change are different. Climate innovation not only needs connections between climate scientists, technology developers and the business community, but also the engagement of many other local actors.

For example, making water treatment sustainable requires changes in regulatory frameworks, payment

schemes for water consumption, and the planning of safety tests. It also requires addressing the concerns of water supply operators to be adopted by the mainstream. This demonstrates how public authorities, non-profit organisations, social entrepreneurs and regional and city planners all play a much more important role in the emergence of a cleantech cluster than for other industrial activities.

Technology development, green business models and social innovation usually go hand in hand in climate innovation clusters, helping them to reach a critical mass. It is not enough just to develop technologies or new businesses, however; climate innovation also needs the engagement of citizens who can decide on whether to adopt new consumer behaviour, such as shifting to energy-efficient home devices.

This scaling up of an innovation can also happen through launching innovative, bundled product–service solutions, in which traditional products are offered together with services. For example, a new business model for solar panels might involve selling the service of providing solar energy, rather than just selling the product of a solar panel.

The implication of all this for cluster policy is the need to sufficiently map the economic and social fabric of climate innovations and the links of everyone involved. This may require new approaches in cluster identification, beyond what traditional statistics can reveal. Policymakers should embrace a wider concept of innovation, one that considers the cultural and social dimensions of climate innovation clustering processes.

Infiltrate manufacturing clusters

Business clusters are usually associated with more jobs, higher wages and increased economic value.⁴ This is why they have long been a popular tool for policymakers looking to stimulate their national or regional economies. However, industrial clusters also generate negative externalities, such as traffic congestion, higher prices and pollution – effects that can contribute to the causes of climate change. The 2014 European Cluster Panorama found that emerging industries often result in a more intensive use of resources and greater environmental impact.⁵

The policy question should therefore address how climate innovations can become agents in existing industrial clusters, changing operations by shifting them to a low-carbon model that places a lower burden on the environment. The role of cluster policy is to build new channels in the economy, where climate innovation can flow into the practices of manufacturing companies and other businesses.

Policies for any industrial or manufacturing cluster can be made in a way that facilitates the uptake of climate innovations. The European Cluster Observatory case study on framework conditions to support clusters in the circular economy showed that 39 per cent of the surveyed cluster organisations are involved in several circular economy activities.⁶

Policies and ventures that facilitate 'industrial symbiosis' are another way to foster links between companies, so that the waste from one sector is used as a resource in another (e.g. the initiative in Rotterdam harbour, where industrial partners are working together to build a sustainable port). Cluster policies that embrace industrial symbiosis can help to mainstream climate innovation, and cluster management organisations can take up the role of facilitators for this. In this sense, cross-sectoral collaboration between cluster is a way to weave climate innovation into the daily activities of other businesses and enterprises.

One way to encourage this is 'Meet the Buyer' events, which use manufacturing clusters as launch pads to divert procurement decisions towards climate-friendly suppliers. These events, organised with private or public procurers, help to facilitate the exchange of information about procurement needs and industrial solutions.

The need for scaling up

When climate innovation start-ups operating in the fields of energy, water or agriculture emerge in one of Europe's many cleantech hot spots, the path to scale up these initiatives is often lengthy. Technological development and ideas are abundant, but the market to sustain these climate entrepreneurs in the long term is often missing. Greater scaling up is needed to support the transformation of other industrial clusters, so that they can serve as potential markets for new low-carbon technologies.

This will only achieve real impact if start-ups manage to scale up and manufacture their innovation on a larger scale, and grow into a vibrant cluster of industries. The policy objective should be to stimulate a leap forward: from technology to commercial profits and the adoption of low-carbon technologies. Fostering and supporting entrepreneurs is important, otherwise their endeavours remain isolated from the main industrial activities that contribute to CO₂ emissions.

Create demand-side support

The demand side of climate innovation has not yet been sufficiently addressed by policy support, even though this

is a crucial factor for the long-term success of emerging cleantech centres. Demand-side support can take the form of tax incentives or loans linked to the creation of markets for clean-tech products; or it can manifest in campaigns to raise awareness of climate innovations, with the involvement of citizens.

One such community-building initiative is the Climate Colab⁷ launched by the Massachusetts Institute of Technology, USA. This functions as a crowdsourcing platform where members, including citizens, business people and scientists, are invited to submit proposals for tackling climate change. They then work with experts and each other to find common solutions.

Triggering demand-side support can also come from innovative insurance policies that promote the adoption of climate-friendly practices. For example, the financial services company Fortis offers a more advantageous mortgage rate for energy-efficient appliances and home upgrades,⁸ and Clean Car Credit financing for low-emission vehicles.

Inter-regional and international cooperation

The places where climate innovations are produced, and the places that could exploit such innovations to transform their industries, are often in different regions or even different countries. This calls for more inter-regional and international cluster cooperation.

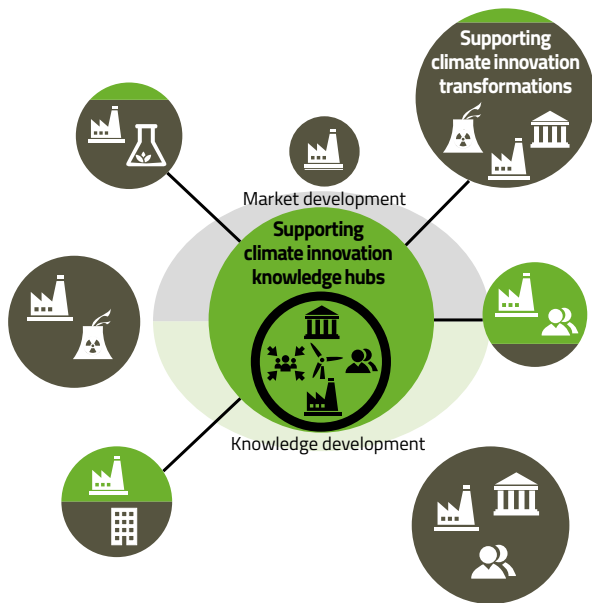
Cluster organisations can be important in fostering the formation of strategic cluster partnerships, and allowing for the greater diffusion of innovative climate technologies and business models. Figure 1 shows a cluster initiative in the middle acting as a knowledge hub on climate innovation, and other industrial clusters that have shifted to a sustainable model to different extents. Climate innovation clusters might be linked to these other industrial clusters to different extents. The aim of policymakers should be to foster stronger interactions between climate innovation clusters and manufacturing clusters.

The role of cluster policies is to consider and sufficiently address the decisive factors that can create the conditions for scaling up climate innovation clusters.

The role of cities

Cities have a vital role to play in the transition towards a low-carbon economy. Because of their multi-sectoral, diverse nature, they are an important focal point for addressing climate change. Favourable business

Figure 1. Thinking of the business ecosystem instead of narrow cluster policy



Source: Author

ecosystems for climate innovations are often formed in cities.

Climate ventures often thrive in cities that manage to become a 'melting pot' for environmentally conscious entrepreneurs. City policymakers can do a lot to create the innovation and business conditions that foster both the supply- and demand-side elements needed for climate innovation. In Canada, for example, Toronto's city leaders and the Centre for Social Innovation joined forces to create the ClimateSpark Social Venture Challenge,⁹ a programme to tackle environmental and climate change issues. This collaboration managed to identify and support social ventures to reduce greenhouse gas emissions.

Conclusions

Cluster policies need to address a broad set of actors, and stimulate collaborative patterns where they can act in synergy, to support the transition to a low-carbon economy. The aims for public intervention should be threefold:

1. Foster climate innovation ventures so that they reach a critical mass.
2. Help climate innovations to diffuse into existing manufacturing clusters, and change their way of working.
3. Map the evidence base, networks and actors in the climate sector to understand and generate favourable framework conditions in the business ecosystem, which can significantly contribute to the successful design of policy interventions.

Endnotes

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Climate-KIC UK and Ireland

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Our partnership consists of dynamic companies, the best academic institutions and public authorities. We drive innovation in tackling climate change through creative partnerships large and small, local and global, and between the private, public and academic sectors. The UK and Ireland is a core geographic region within Climate-KIC and is home to some of the most energetic climate innovation clusters and businesses in Europe.

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