

## The spillover effect of domestic climate action




### How to strengthen the external impact of domestic climate action

Policies and measures adopted by a given country to reduce domestic emissions result in overall emissions reductions that are much higher than those initially targeted by the domestic actions of that country. This spillover effect of domestic action can be further strengthened if the mechanisms and drivers behind it are better understood and utilised.

In our short study<sup>1</sup> we identified three main mechanisms that result in internationalisation of the impact of domestic emissions reductions: policy diffusion, economies of scale, and complementarity of action resulting in the fusion of different technologies. Each of these mechanisms can be divided into specific drivers that can increase the impact of a particular mechanism, such as learning or emulation that accelerates policy diffusion, scaling up and export of domestic standards, increasing the benefits of economies of scale, and contributing niche solutions to a challenge that cannot be solved solely by one country.

**Figure 1:**

Three main mechanisms resulting in the internationalisation of the domestic emissions reductions impact.

<b>SPILLOVER EFFECT</b> Three reasons why domestic climate action of countries can make significant impact well beyond their borders		
 <b>A. Policy diffusion</b>	 <b>B. Economies of scale</b>	 <b>C. Technology fusion</b>
Policy has a tendency of spilling over through mutual learning, diffusion, selection	An uptake of a technology in different countries accelerates an overall reduction in prices	Different pieces of the technology puzzle come together to bring new benefits and shape overall trends
<b>Example</b> <ul style="list-style-type: none"> <li>▶ German Renewable Energy Act</li> <li>▶ EU Emissions Trading Scheme</li> <li>▶ Green New Deal</li> </ul>	<b>Example</b> <ul style="list-style-type: none"> <li>▶ PV and wind</li> <li>▶ Batteries</li> <li>▶ Electrolysers</li> </ul>	<b>Example</b> <ul style="list-style-type: none"> <li>▶ Electrification of transport</li> <li>▶ Integration of renewables</li> <li>▶ Low-carbon steel</li> </ul>
<b>Main actors</b> <ul style="list-style-type: none"> <li>▶ Governments - shape policy</li> <li>▶ NGOs - compare climate action</li> <li>▶ International organizations - exchange experiences</li> </ul>	<b>Main actors</b> <ul style="list-style-type: none"> <li>▶ Governments - set goals</li> <li>▶ Industry - cooperate to take advantage of the economies of scale</li> </ul>	<b>Main actors</b> <ul style="list-style-type: none"> <li>▶ Governments - set goals</li> <li>▶ Research institutes and Industry - develop and implement solutions</li> </ul>

<sup>1</sup> This factsheet summarizes the main conclusions of a short study available under <https://climateanalytics.org/publications/2020/beyond-borders-how-to-strengthen-the-external-impact-of-domestic-climate-action/>

# 1 Driving policy diffusion

Policy diffusion happens when a policy adopted by one country is implemented in other countries. The literature on this topic identifies four main drivers of policy diffusion, three of which play an important role in facilitating the spillover effect of domestic climate action. Policy **learning** is the most common of the drivers and takes place when national or local governments adopt policies based on already existing experiences of other countries. It can also go beyond a *single policy* and concern a whole package of measures, e.g. in reaction to economic crisis as was the case after the 2008/2009 economic crisis) or to meet a similar challenge (e.g. climate change). Another driver of policy diffusion is **emulation**, e.g. when one country copies the policies already adopted in another country due to their perception as appropriate and legitimate. It is driven by the desire of domestic policy makers to conform to internationally recognised norms. Policy makers may also adopt certain policies to **compete** with other national or subnational governments (Baybeck, Berry, and Siegel 2011; Butler et al. 2017; Heinze 2011).

**Figure 2:**

Three drivers of policy diffusion.



Policy **learning** can drive policy diffusion by providing a balanced overview of the costs and benefits of a certain climate policy. This overview should not only focus on the environmental impacts (e.g. greenhouse gas emission reductions), but also economic, and social co-benefits. Should the policy be perceived as attractive to other countries, its uptake can be facilitated by the provision of easily accessible, first-hand information, combined with their adaptation to the local circumstances. This can be facilitated by the existence of transfer agents, who mediate these experiences and define how certain policies fit specific national goals in a particular country.

The obligation to submit more ambitious NDCs in 2020 offers an opportunity to link countries' contributions with the latest science on emission reduction pathways needed to meet the Paris Agreement's 1.5°C temperature limit. Each country submitting a science-based NDC increases pressure on other countries to do the same. This increases the role of the **emulation driver**, which makes reliance on science in defining mitigation goals the "default" option.

**Competition** may be used as a driver of policy diffusion by showing that policies aimed at increasing renewable energy development and making economies more energy efficient may in fact accelerate economic growth. These economic benefits can be strengthened by the first-mover advantage. Beyond joining the climate change mitigation race in areas in which it is already happening, e.g. development of renewable energies, e-mobility, or the hydrogen economy, climate leaders may trigger the climate mitigation race in areas in which it has not yet been happening, e.g. efficiency in the building sector.

## 2 Reaping the benefits of economies of scale

The economies of scale offer the potential to create a spillover effect of domestic climate action well beyond the respective country. This can happen in two main ways, both of which take advantage of the fact that upscaling the production of a product decreases its financial costs: creating domestic market for a product essential for decarbonisation and setting domestic emissions standards for an already existing, mass produced product.

**Figure 3:**

Two ways to leverage domestic climate actions through economies of scale.



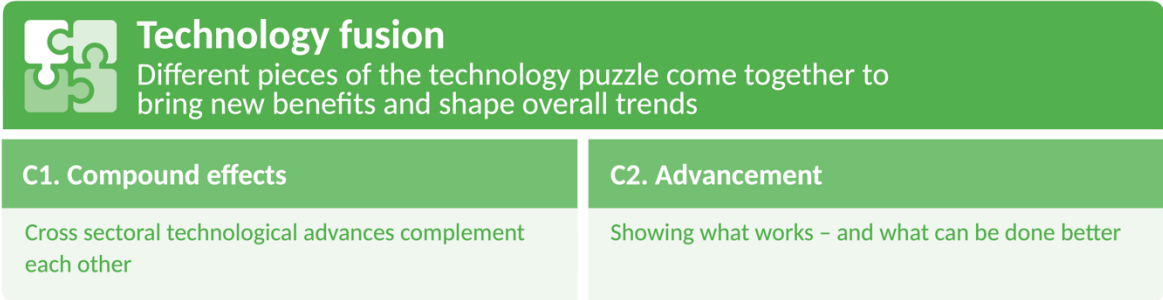
Each new country creating conditions favorable for the development of renewables contributes to increasing the market for renewable energy installations and a corresponding **decrease in their costs for other countries**. This has already happened for wind and solar energy installations. Between 2005 and 2019 the number of countries with policy targets for renewable energy increased from 45 to 166 (REN21 2005, 2020) . At the same time, the price of PV fell from \$4.51 to \$0.38 for each installed Watt, a decrease by 92% (Our World in Data 2020). For wind energy the Levelized Cost of Electricity (LCOE) almost halved in the same period from \$104/MWh to \$53/MWh (IRENA 2020). Similar trend can currently be observed for batteries and electric vehicles. Thus, by introducing policies that would create or scale up markets for decarbonisation technologies such as electrolysers for hydrogen generation, governments can facilitate costs decrease and speed up emissions reductions in many sectors.

Economies of scale make manufacturing smaller series of different products for markets with different environmental standards less profitable than simply fulfilling the stricter standards for all products. This has already been the case for combustion vehicles which have in many cases been adapted to the strictest existing standards in the meaningful markets (Crippa et al. 2016; Vogel 1997). The tendency for **emissions standards to spread beyond the borders of the country that adopts them** can have repercussions for many other products (e.g. low carbon steel or cement) and could trigger investments in corresponding manufacturing capabilities. Requirements to use low carbon materials for electric vehicles could result in mainstreaming such products and taking this requirement into consideration at the design stage. Standardised building materials could be required to fulfill requirements needed for zero-emissions buildings.

### 3 Contributing to the decarbonisation puzzle

The transformational change needed to meet the Paris Agreement temperature goal requires numerous and rapid technological solutions. In this regard as well, domestic action may drive decarbonisation well beyond its borders either by contributing new technologies or showing how different stages on the path to full decarbonisation may look.

Figure 4:



The complexity and scale of the transformation to a zero-carbon economy makes it impossible for one country to develop all the elements needed for full decarbonisation. However, this complexity also presents countries with numerous opportunities to develop specific **technologies still missing or decreasing the costs of already existing ones** using their specific expertise. This complementarity of effort makes it easier for the other countries to accelerate their decarbonisation efforts and increases the innovativeness of their respective economies.

The challenge of contributing solutions to a fully decarbonised economy is deepened by the fact that it is not completely clear **how a future low-carbon economy will look**. This may result in lack of conviction that a full decarbonisation is possible based on the existing mix of technologies. Experiences of countries taking over the leadership in climate change mitigation may show what is possible and what challenges lie ahead. As countries progress towards full decarbonisation, there will be numerous intermediary stages (e.g. phase out of one fossil fuel after the other in different sectors of the economy). These stages will occur **in different countries at different points in time**. These experiences will also push the limits of what is deemed possible thus emboldening others to follow in their footsteps to not only increase climate ambition but follow with deployment of practical climate mitigation measures. This will facilitate the spillover effect of domestic action well beyond the borders of a single country.

### 4 Conclusion and repercussions

Intended or not, domestic action and inaction influences the decisions of other governments and shapes the economics and narrative within which their decisions are made. Countries can strengthen the impact of their climate mitigation by **active leadership** which requires sharing a country’s experiences – good and bad – with other governments. **Transfer agents** supporting countries in understanding the policies and figuring out how they may be adapted to the specific circumstances may increase the policy uptake. A country may also specialise in a technology or solution that is underdeveloped or still missing to complete the picture of a fully decarbonised energy sector.

The spillover impact of domestic action is strengthened by the backdrop of the current COVID-19 induced health and economic crises. While unusual times call for unusual measures, political leaders may be prone to adopt measures that have already been adopted in other countries.

Greening the recovery packages in one country may significantly increase the probability that other countries will also focus on climate mitigation in their recovery packages, triggering transformative change.

Countries may leverage the spillover effect of their green recovery packages by a corresponding increase in the level of ambition and timely submission in 2020 of new and updated NDCs. The timing presents an opportunity: focusing on climate change mitigation in the recovery packages will, at least in part, determine the emission reduction levels in the 2020s and thus offers the potential to increase the level of ambition for 2030 in the NDCs. The recovery packages should also trigger the development of new solutions, essential for reaching the net zero goal by 2050.

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## Imprint

### Publisher

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**Completion:** November/2020