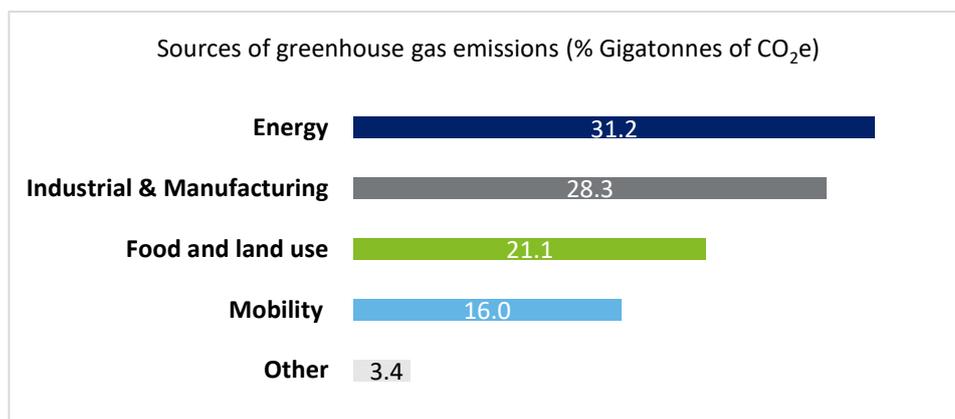




## Policy considerations for a low-carbon negative emissions system

### Introduction

A global low-carbon transition across a range of systems such as energy, mobility, food, and manufacturing, is essential to achieving a low-carbon future but emission reductions alone will not be enough to achieving net-zero as these systems will still emit greenhouse gases. Many credible analyses on achieving net zero by 2050, including the Intergovernmental Panel on Climate Change's 2018 benchmark report, factors in significant carbon removal and the prevention of additional deforestation<sup>i</sup> signifying that a net-zero future needs a robust negative emissions system to supplement the low-carbon transition.



Carbon removal efforts are nascent and not yet at a scale that can deliver the necessary impact. The current technology remains costly and has yet to be proven at scale. At the same time, the forests, grasslands, and wetlands that are stable carbon sinks are being rapidly depleted. The negative emissions system is fragmented, lacking the much-needed support to scale-up and become integrated into a low-carbon economy.

A global shift to a system of systems approach—that recognizes the importance of emissions reductions and emissions removal working in tandem—is needed to accelerate the transition to a low-carbon economy. Nature and technology will both play an important role, but public policies are needed to scale-up the negative emissions system to achieve a net-zero future.

This approach recognizes that the transition to a low-emission economy will require transforming a series of complex, interconnected, emissions free systems; and that catalytic change can only happen by working at the intersections of those systems. Government, businesses, consumers as well as finance, and technology all have key roles to play in accelerating the emergence of low-carbon systems.

A global low-carbon transition will undoubtedly put many workers at risk as their jobs become obsolete, particularly in the fossil fuel industry. Advancements in the negative emissions system have the potential to create a significant number of green jobs that could buffer the low-carbon transition. Governments should consider how they can seize upon this transition and make investments in reskilling and job matching so that vulnerable workforces can make quick and efficient career transitions into the low-carbon economy.

## Policies and policy levers—five considerations to be addressed

Policy makers are faced with a vast and varied array of choices about how to move their countries to a net-zero future. While most agree that this critical have committed to the Paris Agreement, how best to get there is a matter of continuing debate.

### **1. Governments should encourage sustainable investment in natural climate solutions.**

Natural climate solutions remain inexpensive when compared to carbon removal technologies, but they often require long-term commitments that may preclude companies and communities from investing in such projects. One option to incentivize investment into natural climate solutions is to create standardized carbon credits that can be traded within well-functioning carbon markets, providing the flexibility companies are looking for. This would help increase the flow of capital into natural climate solutions while also providing critical funding for early-stage technologies.

Governments may also consider mandates that require companies to meet emissions targets and/or compensate for the full cost of negative externalities of today's higher carbon energy to incentivize widespread participation in carbon markets. Many systems already exist in jurisdictions such as the EU and California, both of which utilize cap and trade systems. Other jurisdictions, such as Switzerland, opt for a fee and dividend system. Where carbon regulations do not yet exist, those governments could explore using existing regulations as frameworks to develop and implement the necessary measures. Standardization and transparency will be key to promote confidence, participation, and growth in carbon markets to accelerate natural climate solutions.

### **2. Policy makers, private sector, civil society, local communities, and indigenous peoples must collaborate to effectively conserve and restore the land and water systems that remove and store carbon naturally.**

Government tax incentives that support widespread ecosystem restoration and conservation play a key role in preventing further deterioration of these natural carbon sinks. For example, the Canadian federal government has set land and ocean conservation targets, as well as government supported large scale reforestation, acknowledging the importance of nature in achieving its climate goals. <sup>ii</sup> The creation of emissions regulations and robust carbon markets will further incentivize private sector investments in reforestation, afforestation, and conservation efforts.

### **3. Innovation in the negative emissions sector needs government support.**

Nature alone cannot be relied upon to remove and store the amount of emissions necessary for a net-zero future. Carbon capture, utilization, and storage (CCUS) technologies are essential to remove, repurpose, and permanently store carbon emissions. The current large scale CCUS facilities around the world have the capacity to store only 40 million tons of CO<sub>2</sub> annually, far surpassed by global annual CO<sub>2</sub> emissions, which exceeded 35 billion tons in 2019. <sup>iii, iv</sup>

Governments need to accelerate CCUS deployment and close the gap between CCUS capacity and global emissions. Policies and zero- or low-cost investments are needed to support the maturation of nascent technologies, rapid scaling-up of current technologies and commercialization of proven technologies. For example, the U.S. Department of Energy's Carbon Capture Program is conducting research and development to reduce costs and energy requirements for carbon capture technologies.<sup>v</sup> Supporting these projects using existing government resources, such as human capital and research facilities, and partnering with academic institutions will help accelerate the maturation process.

#### **4. Governments need to support the retrofitting and scaling of existing infrastructure for effective carbon capture technologies.**

Opportunities to retrofit large emitter facilities with CCUS or implement significant facilities build-out and modification efforts already exist. But this requires dedicated carbon transportation and storage infrastructure. The UK, through the Carbon Capture, Usage and Storage Infrastructure Fund, has committed significant investment to support the CCUS ecosystem, including transport and storage infrastructure investment and reducing first mover disadvantages.<sup>vi</sup> Such government support through policies and investments accelerates the integration of CCUS technologies into low-carbon system of systems.

#### **5. Policies should minimize the social consequences of the low-carbon transition.**

Whatever policies governments choose, they should consider the impact that a low-carbon transition will have on those people whose jobs will be affected. Workers in vulnerable industries will need support to develop the right skills and get matched with new jobs in the low-carbon system. For example, the large scale CCUS infrastructure and its associated ongoing maintenance will provide significant employment opportunities and growth. Governments should consider how to effectively and efficiently reskill and re-educate their workforces to prevent leaving people behind.

### **Find out more**

- Deloitte's [system of systems approach](#)
- Deloitte's [Climate Exchange](#)

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<sup>i</sup> Allen et al., Global warming of 1.5°C, chapter 4: "Strengthening and implementing the global response," Intergovernmental Panel for Climate Change, June 2019.

<sup>ii</sup> Government of Canada, "[Canada Nature Fund](#)," accessed October 20, 2021.

<sup>iii</sup> International Energy Agency, "[Global energy review: CO2 emissions in 2020](#)," March 2, 2021; Global CCS Institute, [Global Status of CCS 2019: Targeting Climate Change](#)," December 2019.

<sup>iv</sup> Our World in Data, "[Annual CO2 emissions](#)," accessed October 25, 2021

<sup>v</sup> U.S. Department of Energy, "[Carbon Capture R&D – Office of Fossil Energy and Carbon Management](#)," accessed October 21, 2021

<sup>vi</sup> United Kingdom Department for Business, Energy & Industrial Strategy, "[The Carbon Capture and Storage Infrastructure Fund](#)," May 2021

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