

Managing a Sustainable Transition to a Low-carbon Society: The Socio-economic Impacts of Mitigation Policies

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This policy brief looks at how to identify and manage the expected and unintended socio-economic impacts of greenhouse gas mitigation policies.

1. Overview

Climate change, as a great challenge facing humanity, needs to be addressed urgently, with great efficacy and efficiency. But it also needs to be addressed in a sustainable way, which implies that we must understand and manage as far as possible all impacts, expected and unexpected, positive and negative, domestic and international.

Policies that target the mitigation of greenhouse gas (GHG) emissions will invariably, like other policies, have unexpected, and sometimes undesirable, socio-economic impacts. Many of them are positive, known as co-benefits, and are in most cases welcome.

Others can have negative socio-economic impacts. This policy brief focuses on how to identify, measure and manage those negative impacts. The recognition of unexpected negative socio-economic impacts is not in any way intended to discourage action and ambition. On the contrary, identifying negative impacts, and providing a plan to manage them, should reassure stakeholders, allow for higher levels of ambition and a more rapid transformation and transition.

One must also be reminded that the costs of inaction are much higher than the upfront costs of action, and costs associated with the transition. Moreover, there is an intertemporal element in that long-term positive outcomes can be accompanied by short-term negative impacts, which need to be managed, and mitigated.

The transition must be managed to keep harmony between all three pillars of sustainability—integrity of environmental protection, economic growth that leads to improved standards of living, as well as social solidarity, equity and cohesion.

The Paris Agreement negotiated in 2015 requires actions by all parties, according to the principles of the United Nations Framework Convention on Climate Change (UNFCCC). The impacts, and the sustainability of the transition, need to be examined from the points of view of both developed and developing countries.

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In developed countries, while there are positive effects, some will see the issue of transition through the lens of competitiveness, and its social and economic impacts—domestic economic displacement and disorderly (energy) markets, with negative impacts from changed trade flows and investment patterns. Even if, at first blush, many actions can be seen as domestic measures, they can also impact other countries, in particular developing ones, which is sometimes difficult to predict upfront.

Developed countries, in undertaking the transition to a low-GHG economy, will want to put in place a safety net for both the social and economic impacts of these measures, through a variety of instruments.

Developing countries will usually focus first on resilience, vulnerability, economic and social transformation, and diversification. Similarly, human development and the improvement of standards of living are also elements of development policies that contain measures to address climate change.

This policy brief will first discuss the scope of mitigation actions which will reduce GHG emissions and their impacts, including how they are distributed, who is affected, in what way and to what degree. It will then identify “*flanking measures*,” which for the purpose of this policy brief are understood to be measures that will manage the undesirable, and sometimes unexpected, socio-economic impacts of mitigation actions, including distributional impacts.

2. Mitigation Measures And Impacts

2.1 Mitigation Measures

In most jurisdictions, there are many GHG mitigation policies and measures, some of them labelled as climate change mitigation policies. Other policies have GHG mitigation impacts but address other concerns, including economic and security of supply concerns.

Mitigation policies that will have socio-economic impacts, and may affect the sustainability of the transition, will be primarily domestic in nature. The measures with the most visible socio-economic impacts are various types of carbon pricing.

There are many types of mitigation policies; one visible type are explicit carbon prices, which includes cap-and-trade systems and carbon taxes, and other mitigation policies where carbon pricing is implicitly embedded in other taxes and subsidies, such as energy taxes on oil, gas and coal products, tax credits for renewable energy projects, policies to encourage renewable energy, biofuels, etc.

Box 1. Domestic mitigation measures

Emission trading in the European Union

The EU emission trading system (EU ETS) was adopted in 2003 and covers more than 11,000 energy-intensive installations in 31 countries (EU members plus Iceland, Liechtenstein and Norway), representing around 45 percent of total GHG emissions in the EU. The EU ETS is a cap-and-trade system, with a resulting carbon price. The first phase started in 2005 and the current (third) phase aims to reach the EU-wide target of cutting emissions from covered sectors by 21 percent by 2020 compared to 2005 levels. The next phase (2021-2030) aims to cut covered emissions by 43 percent compared to 2005. Sectors covered include power, cement, steel and aviation.

Carbon taxes in British Columbia

In 2008, the Canadian province of British Columbia introduced North America’s first broad-based carbon tax applied to the purchase or use of fossil fuels. The carbon tax covers approximately 70

Box 1. *Continued*

percent of provincial greenhouse gas emissions. By setting a price on carbon, the tax provides a signal in the economy to reduce greenhouse gas emissions and spur innovation. The carbon tax was introduced at C\$10/t CO₂ equivalent (US\$7.93 at April 2018 exchange rates) in 2008 and rose annually in C\$5 increments until it reached C\$30/t CO₂ in 2012. The tax will start increasing again in C\$5/t CO₂ increments in April 2018 until it reaches C\$50/t CO₂ in 2021. Independent studies have found that between the implementation of the tax in 2008 and 2012 fuel use in British Columbia dropped by 16 percent per capita, and emissions by between 5 and 15 percent from what they would have been in the absence of the tax.

British Columbia recognises the need to protect household affordability and to support the transition to a lower carbon economy. In 2016/2017, the carbon tax generated C\$1.22 billion. Going forward in 2018, the revenue recycling measures are not required to offset carbon tax revenues allowing the government to spend carbon tax revenues on measures that reduce emissions.

Energy taxes in France

In 2014, the equivalent of a carbon tax was introduced in France; it actually consists of a carbon component as part of existing taxes on energy consumption. Its long-term trajectory (up to 2030) is enshrined in law, to ensure long-term regulatory stability for investments. Its level of ambition was raised in the July 2017 Climate Plan to €86.20/t CO₂ (US\$106.44 at April 2018 exchange rates), starting in 2022 (compared to €30.50/t CO₂ in 2017). These tax rates aim at triggering the necessary cuts in GHG emissions to deliver on the commitments made in the French Nationally Determined Contributions in light of the Paris Agreement.

Phase-out of fossil fuel subsidies in Ghana

After two previously failed attempts, the Ghanaian government decided to reduce fossil fuel subsidies from 2006 onwards. This subsidy reform aimed to create a pricing mechanism to keep domestic prices in line with international prices. The reform has clear environmental benefits; however, the main objective was to cut government spending with the goal to reduce its debt and increase financial stability.

Product Environmental Footprint (PEF) scheme in the EU

The PEF is a voluntary EU-led labelling scheme. It aims to simplify environmental labelling in the EU by providing a common methodology, verification methods and rules for communication for producers within specific product groups. Among other things, it aims to set out common rules on how to measure the life cycle environmental performance of the products covered. The pilot process ran from 2013-2016, covering 26 pilots, and is currently under review.

In some cases, GHG mitigation policies that are either international in nature—such as by the International Civil Aviation Organization (ICAO) or the International Maritime Organization (IMO)—or are implemented in another jurisdiction could also have a significant impact. Socio-economic impacts of all three types of policies—domestic, national impacts from policies in other jurisdictions and international policies with national impacts—need to be identified and addressed.

Box 2. International mitigation measures

International Civil Aviation Organization

In light of global efforts to mitigate climate change and address the growing share of aviation in global CO₂ emissions ICAO introduced two goals for international aviation in 2010: annual fuel efficiency improvements of 2 percent and carbon neutral growth from 2020 onwards (CNG2020). To help reach the carbon neutral growth goal, the General Assembly of ICAO decided in 2013 to develop a global market-based mechanism, called the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). CORSIA's purpose will be to monitor and report CO₂ emissions from international civil aviation and offset emissions above the 2020 base level. The proposed scheme will run until 2035, with a route-based approach. A pilot phase with voluntary participant states is scheduled to start in 2021.

2.2 Identification of Impacts

To address and manage the socio-economic impacts of climate change mitigation efforts, it is necessary to first identify and quantify those impacts.

Research has shown that GHG emissions mitigation policies and projects may have significant socio-economic impacts, other than the intended reduction of GHG. As noted, some of these impacts may be expected and desirable, commonly labelled as co-benefits, while others will be negative, and sometimes unexpected or unintended.

Negative but unintended socio-economic impacts need to be managed. For example, the EU Emissions Trading System (EU ETS) was introduced to put a cap on total emissions and a price per tonne of GHG emitted. This allowed economically rational decision-making processes to guide asset allocation: GHG-intensive products and production processes would become more expensive, making low-GHG alternatives more attractive.

Among the intended impacts of the EU ETS were the encouragement of low-GHG innovation and energy or fuel savings, the dissemination of green technology and the creation of price incentives to choose low-GHG alternatives.

At the same time, the EU ETS was not intended to encourage production activity to move to jurisdictions with no or less stringent climate change policies, which might result in higher GHG emissions elsewhere. This phenomenon is known as carbon leakage.

Other short-term unintended socio-economic impacts may include domestic job losses, distributional effects for lower-income households and changes in international competitiveness. Such impacts may affect the ability and willingness of countries to follow a path towards sustainable development.

To identify the impacts of GHG mitigation efforts, in a systematic and systemic manner, they need to be examined with respect to the three pillars of sustainable development. The negative impacts can also be categorised as follows.

- *Economic impacts*, such as changes in trade, production or investment trends, growth or reduction in different sectors, changes in international competitiveness, carbon leakage, cost structures, changes in disposable income, etc.
- *Social impacts*, such as job and income losses in sectors, need for retraining and human capacity building, inclusion of stakeholders in decision-making processes, etc.

- *Environmental impacts*, such as changes in non-GHG emissions, air quality, water use and water pollution, deforestation, land use change, etc.

While co-benefits have been welcomed and used as an additional argument to implement GHG mitigation policies, insufficient literature has been devoted to the identification, and even less to the quantification, of negative and unintended impacts.

Box 3. Domestic impacts of mitigation measures

France—distributional impacts of energy taxes

The impact of carbon taxation can be higher for low-income households, who have less capacity to adjust their energy consumption to increasing energy costs and whose energy spending (housing, transport) accounts for a larger share of their revenues. That is the reason why the distributional impacts of the French carbon tax have been carefully assessed to help design compensating measures. Carbon taxes are expected to reduce the demand for fossil fuels and ultimately GHG emissions, but that goal should not be reached at the expense of a rise in energy poverty.

Ghana—social impacts of the fossil fuel subsidy phase-out

The fossil fuel subsidy phase-out of 2006 intended to enable financial savings for the government, while welcoming the co-benefits of emission reduction. The phase-out also had two notable social impacts. First: a redistributive effect on society as a whole, leading to a reduction in inequality. Indeed, fossil fuel subsidies are inherently regressive and have proven to benefit the rich more than the poor. Second: an adverse impact on the poorest. Any subsidy removal constitutes a loss of income, which is felt hardest by those who are already vulnerable, reducing their ability to consume and pushing households further into poverty.

Outside the highly politicised UNFCCC negotiations, little attention has been paid to understanding the socio-economic impacts from GHG mitigation policies in other jurisdictions. But in today's highly globalised economy and society, such a question should not be viewed as inappropriate.

Box 4. International impacts of mitigation measures in other jurisdictions

Environmental footprint (PEF) scheme in the EU

It has been argued that the scheme impacts small producers, many of them located in developing countries, as standards are inherently more difficult to meet for smaller producers; they may lack access to information and the capacity (human and financial) to comply with this regulation. Goods that rely on many small producers at the base of the value chain (like cocoa, palm oil, shrimp, rice and other major developing country agri-food exports) will tend to be affected disproportionately.

Airline carbon taxes for the Caribbean

In 2010, Caribbean tourism ministers raised concern about the effects of the UK Air Passenger Duty. Their report highlighted the negative effects the duty was having on the Caribbean tourism economy and the Caribbean community living in the UK. One of the main concerns was the use of a four-tier banding system, which placed the Caribbean in a higher tax tier compared to other popular destinations in the area, creating a competitive pricing disadvantage. The change in

Box 4. Continued

airfares, combined with the competitive disadvantage, presumably caused a drop in demand for flights to the Caribbean by tourists, who chose other destinations instead. Moreover, the duty negatively affected the Caribbean diaspora living in the UK, making it more expensive for them to visit their friends and relatives in the Caribbean, which also caused a drop in demand for this type of flights.

Many jurisdictions that implement GHG mitigation policies do monitor their domestic impacts, with a strong focus on economic as well as social impacts. This is done for a variety of reasons, including legal obligations related to the implementation of any new legislation or regulation.

In addition, as the international climate regime is still seen as asymmetric, some jurisdictions are concerned about the socio-economic impact of the policies of others on their own territory, for example on trade and investment flows.

2.3 Quantification of Impacts

Countries use various tools and procedures to identify and quantify impacts: either *ex ante*—before the policy has been implemented—or *ex post*—after the policy has been implemented.

Box 5. Impact assessments

Impact assessment of the EU ETS

The impact assessment for EU policies, undertaken by the European Commission, takes a wide variety of environmental, economic and social impacts into account. In assessing the EU ETS, the Commission includes calculations of the impacts on competition and employment, besides analysing the economic efficiency and environmental effectiveness of the mechanism. However, these in-depth investigations frequently stop at the EU's borders. The only international impacts taken into consideration are related to domestic competitiveness concerns and, occasionally, their effects on trade with least developed countries (LDCs).

World Bank processes

The World Bank requires impact assessments and “environment and social management frameworks” for programmes or projects it supports, funds or approves in order to ensure their sustainability. Community consultation also plays a large role in identifying and managing socio-economic impacts in the procedures set out by the World Bank.

Assessing socio-economic impacts *ex ante* has the clear benefit of allowing for the management of expected impacts before they occur, and the incorporation of tools to manage risks at an early stage. Impact assessments are used to determine whether any social, environmental or economic impacts are to be expected if the proposal should become law or be implemented.

Most international and multilateral donors and organisations play an important role in the identification of impacts. For example, the UNFCCC has extensive capacity-building programmes in place to aid countries in involving stakeholders during the implementation of climate change policies and in starting impact identification procedures.

A tool for assessing impacts that is potentially less costly, and has a shorter timeline, is stakeholder consultations. These consultations aim to gather the views of a wide range of stakeholders on a policy or project, to identify and understand their concerns and define ways to take them into account. Community consultations focus on those directly affected by the project, and play a large role in identifying and managing socio-economic impacts in procedures set out by the World Bank.

Ex post identification of socio-economic impacts has the advantage of hindsight: real impacts can be observed, lessons can be drawn and solutions presented. It can consequently inform the revision of the mitigation measures. However, the clear disadvantage is that socio-economic risks which can be expected are not mitigated, which would be possible if these processes are conducted *ex ante*. In addition, “end-of-pipe” solutions may be more expensive for addressing socio-economic impacts.

For the moment, many climate change mitigation policies may simply be too “young” for *ex post* analysis, as impacts may not have yet materialised.

3. Managing Socio-Economic Impacts: Flanking Measures

Once socio-economic impacts have been identified and quantified, the next step is to manage them. Tools and measures that minimise negative impacts *ex ante* can often be considered a form of risk management. In the literature, they are called “flanking measures,” which accompany the intended policy measures. They are meant to ensure that the expected, and maybe unintended, impacts of a policy or action do not materialise, or are quickly mitigated once they materialise.

Ex post flanking measures focus on compensating stakeholders for socio-economic impacts after they have materialised. This approach has the advantage that compensation measures can select their target more precisely, both by focusing on those stakeholders that have experienced impacts and by only compensating for the observed impacts. However, as noted, it may also inherently be more inefficient than avoiding impacts in the first place via *ex ante* measures.

Compensating *ex post* decreases the risk associated with *ex ante* flanking measures of either not (sufficiently) compensating or overcompensating for adversely impacted stakeholders. This risk is real and has, for example, been observed in the EU ETS, as the design did not account for changes in real production levels.

Ex post flanking measures may also have a broader scope than *ex ante* measures. For example, social security and safety nets in developed countries will be activated if climate change policies lead to losses in employment or closures of plants. These safety nets can include unemployment benefits in conjunction with retraining and support programmes, and early retirement schemes.

3.1. Domestic Flanking Measures

While the list of tools to manage the domestic (unintended) socio-economic impacts of climate change policies can be extensive, most can be classified under four headings:

- 1) Cost alleviation
- 2) Domestic safety nets
- 3) Timing of implementing the mitigation action
- 4) Planning and management of projects and programmes

The prime example of a **cost alleviation** tool is free allocation for direct emissions, which is the main tool to manage the risk of carbon leakage currently used in carbon pricing mechanisms across the world. The EU, California, Quebec, New Zealand and South Korea all use varying forms of free allocation. The common

element is that emissions permits are provided, free of charge, to eligible participants covered by the carbon pricing mechanism. It should be noted that any measure to alleviate costs should not mask the carbon price signal.

Box 6. Cost alleviation

Energy taxes in France

The increase in carbon tax rates in France needs to be coupled with the social objective of not leading to energy poverty. The approach used is to compensate for the impact of carbon taxes on household revenues. Targeted compensation measures have been developed so as to avoid placing a burden on low-income households. The main measure consists of an “energy voucher,” which households can use for energy expenditures. It will generally apply to low-income households in 2018: around 4 million households will benefit from this measure, which amounts, on average, to €150 per household (in order to avoid adverse effects, the amount depends on the household income and composition, but not on energy consumption). The amount will be raised to an average of €200 in 2019. “Preventive” flanking measures are also being put in place that aim to help households reduce their energy consumption—and exposure to tax rate increases. Several measures aim to encourage household energy efficiency through thermal insulation: these include an energy transition tax credit, VAT reductions, green zero-interest loans, energy-saving certificates, among others. The French government has also set itself the goal of eliminating the approximately 7 million “heat sieves” within 10 years. Measures to promote clean transport accessible to all are also being developed, notably with a €1,000 transition bonus for replacing old vehicles with low-emissions ones (€2,000 for low-income households).

Phase-out of fossil fuel subsidies in Ghana

A number of cost-alleviation initiatives accompanied the gradual phase-down of fossil fuel subsidies. For example, the Solar Lantern Distribution Programme aims to distribute 200,000 solar lanterns by 2018 at heavily subsidised prices to off-grid communities. This is only one example of a wider set of social policies, initiated in the last decade and financed with relocated resources, to mitigate the negative economic impacts of the subsidy phase-out, including free primary education, a minimum wage increase, an increase in the availability of, and price ceiling for, public transport and increased spending on the existing Community Health Compound and Rural Electrification schemes.

For the most part, **national safety nets** are in place today in the developed countries analysed in case studies. When plants close in developed countries, the operator of the plant sometimes limits the number of compulsory redundancies through redeployment, voluntary redundancies and by providing packages and outplacement programmes. In case of large job losses (for example, the closure of a car factory), affected operators or regions can receive support from governments to help manage the socio-economic impacts on workers and create new employment opportunities in clean economic activities.

By choosing the right **timing** when implementing a policy it is possible to substantially decrease potential negative socio-economic impacts. Delaying segments of policies to give stakeholders more time to adapt their behaviour, or waiting for other factors, such as changes in energy prices, are approaches that can potentially be effective.

Box 7. Timing

Ghana—timing of fossil fuel subsidy phase-out

On several occasions since the early 2000s, Ghana has attempted to phase out or phase down fossil fuel subsidies. Each time, such attempts were faced by public protests and pressure from voters and the reform consequentially withdrawn. By phasing out fossil fuel subsidies more slowly, timing the legislation after a national communication campaign to alter the public perception and putting other measures in place to protect the poor (including for example the solar lantern distribution programme mentioned in Box 6), the 2006 attempt was more successful.

British Columbia—phase-in of carbon tax

As presented in Box 1, British Columbia chose to phase in its carbon tax over a period of time to give individuals and businesses time to adjust. Specifically, the carbon tax was introduced at C\$10/t CO₂ equivalent emissions in 2008 and increased annually by C\$5/t CO₂ over four years until it reached C\$30/t CO₂ in 2012. The tax will start increasing again in C\$5/t CO₂ increments in April 2018 until it reaches C\$50/t CO₂ in 2021.

The **planning and management of projects and programmes** (during implementation or construction) can contribute to identifying and managing socio-economic impacts at the micro-level. This requires understanding of, and attention to, potential unintended negative impacts.

3.2. International Flanking Measures

At the international level, several tools and mechanisms are in place to provide support to countries in order to cope with the socio-economic impacts of climate change mitigation policies. These include access to finance, capacity building and the inclusion of flanking measures in international climate change policies and projects.

Most international tools are clearly aimed at assisting developing and vulnerable countries. Developed countries, on the other hand, depend mostly on domestic measures and tools to manage the unintended negative socio-economic impacts of climate change policies, as shown.

A lack of funding and absorptive capabilities in developing countries adds to the challenge of implementing ambitious climate change policies and projects and of managing the socio-economic impacts of those policies. Therefore, the primary international tool used to manage socio-economic impacts of climate change, especially for developing countries, is **financial support**. International cooperation for **capacity building** is also critical.

The **inclusion of flanking mechanisms** such as offset mechanisms, de minimis thresholds and a slower phase-in for developing and vulnerable countries can also help manage the socio-economic impacts of international climate change policies for countries deemed to be the most vulnerable.

A number of international tools remain underutilised. The UNFCCC's Technology Mechanism and the Green Climate Fund, for example, can be further exploited in the future. The future and direction of the Technology Mechanism also depends on the climate financing promised by developed countries to assist developing countries in the low-GHG transition.

At the UNFCCC level, parties have committed to consider the adverse impacts of climate change policies and projects (also known as “response measures”), especially for developing countries, including in the Kyoto Protocol which contains a promise to strive to minimise the adverse impacts of climate change mitigation policies on other parties, in particular developing countries. Additionally, the Paris Agreement recognises that parties may be affected by the impacts of climate change measures and explicitly underlines in Article 4.15 that some parties, such as developing countries, will be more affected than others. However, while there has been considerable debate on how to implement this promise, so far, no new tools have been developed.

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The European Roundtable on Climate and Sustainable Transition (ERCST) falls under the umbrella of ICTSD, in association with a number of other EU think tanks. The initiative is based in Brussels and provides a neutral space where policymakers and regulators can meet stakeholders and discuss climate change policy and a sustainable transition to a low-greenhouse-gas economy.

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