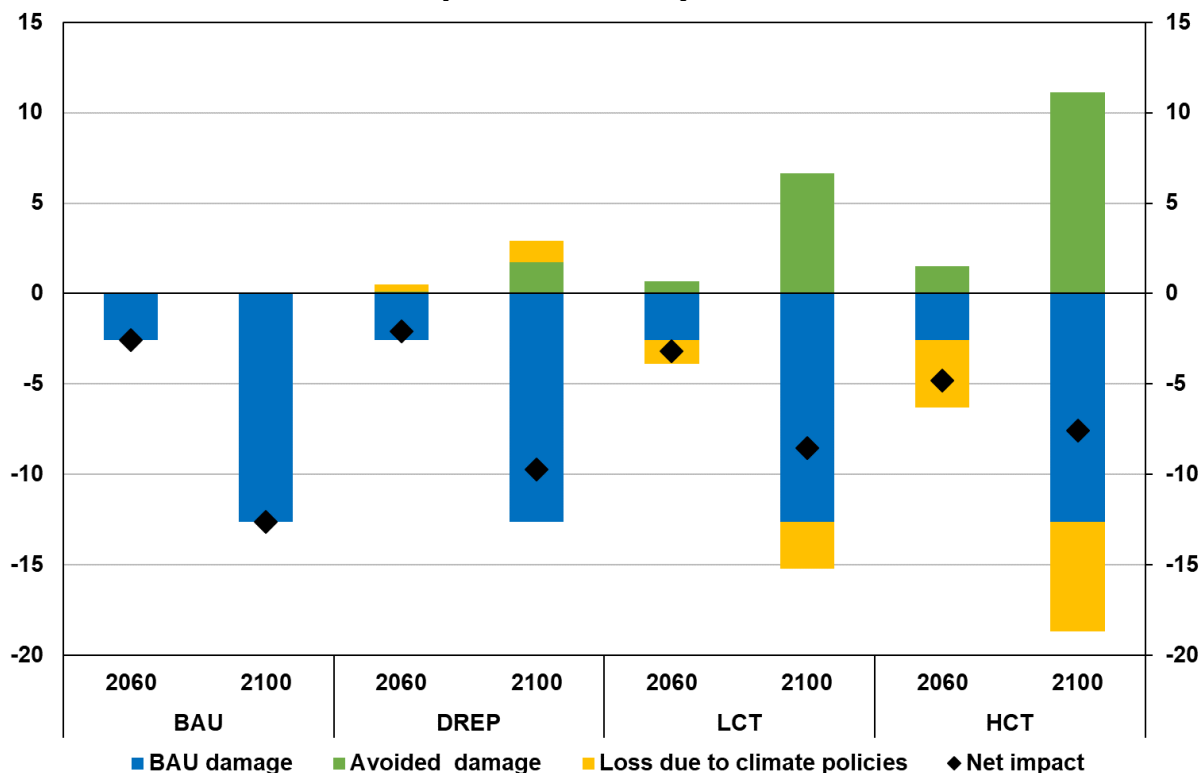


# Climate policy: the challenge of a long term horizon and national interests

By [Claire Alestra](#), [Gilbert Cette](#), [Valérie Chouard](#) and [Rémy Lecat](#)

*Climate policy has so far had limited results despite national commitments under the Paris agreement. Various scenarios establishing a cost-benefit balance of this policy bring to light the main obstacles it is facing. Its net gains are highly significant but remote in time and very unevenly distributed between countries.*

**Chart 1: Impact on world GDP of global warming and climate policies (as a % of GDP)**



Source : Alestra, Cette, Chouard and Lecat (2020)

Notes: Scenarios: BAU=no climate policy, DREP=2% annual decrease in the price of non-CO2 emitting energies, LCT and HCT=annual increase in the price of CO2 emitting energies of 1% and 3% respectively ([Alestra, Cette, Chouard and Lecat \(2020\)](#)).

Climate policy has so far had limited effects. While greenhouse gas (GHG) emissions are expected to fall in 2020 due to the "Great Lockdown", they have continued to increase at an annual rate of 2% per year since the first COP (Conference of the Parties) in 1995. Indeed, climate policy comes up against the divergences between advanced countries and the development needs of emerging countries. In order to convince the world population of its relevance, this policy must be based on scientific studies and diversified analyses of its economic consequences. This post presents a tool for constructing climate policy scenarios which highlights both the gains and the difficulties that accompany such policies. The net benefits thus appear significant but remote in time and unevenly distributed between countries.

### **How to determine the cost-benefit balance of climate policy?**

Climate policy here is mainly based on raising the price of GHG-emitting energies, either through a carbon tax or emission rights, or through regulations that increase the cost of their use. As a result, adjustments are made in the production process, either to use cleaner energy or to save on energy consumption. This affects companies' profitability and productivity and, consequently, their long-term growth. Climate policy therefore has an economic cost that materialises quickly.

Its benefits appear in the longer term, in the form of avoided damage. We focus here on damage with a direct impact on GDP, but the damage goes far beyond that, with impacts on health, international conflicts, and biodiversity. The consumption of GHG-emitting energy leads to a rise in global temperature, which results in a loss of land surfaces, agricultural yields, damage to the production facilities caused by natural disasters, etc. Exposure to this damage varies across countries according to their dependence on agriculture and localised climatic phenomena such as the monsoon. In the scenarios presented here, this damage rises faster than the concentration of GHGs in the atmosphere, which corresponds to the relationship drawn from the literature review by Nordhaus and Moffat (2017). Nevertheless, there is no tipping point beyond which global warming picks up speed, for example with the melting of permafrost.

### **The challenge of a long term horizon and of the unequal distribution of the benefits of climate policy**

Four scenarios, applied uniformly to all countries, are considered:

- Business as usual (BAU): no climate policy;
- Decrease of Renewable Energy relative Price (DREP): 2% annual decrease in the price of non-CO<sub>2</sub> emitting energies;
- Low carbon tax (LCT): 1% annual increase in the price of CO<sub>2</sub> emitting energies;
- High carbon tax (HCT): 3% annual increase in the price of CO<sub>2</sub> emitting energies.

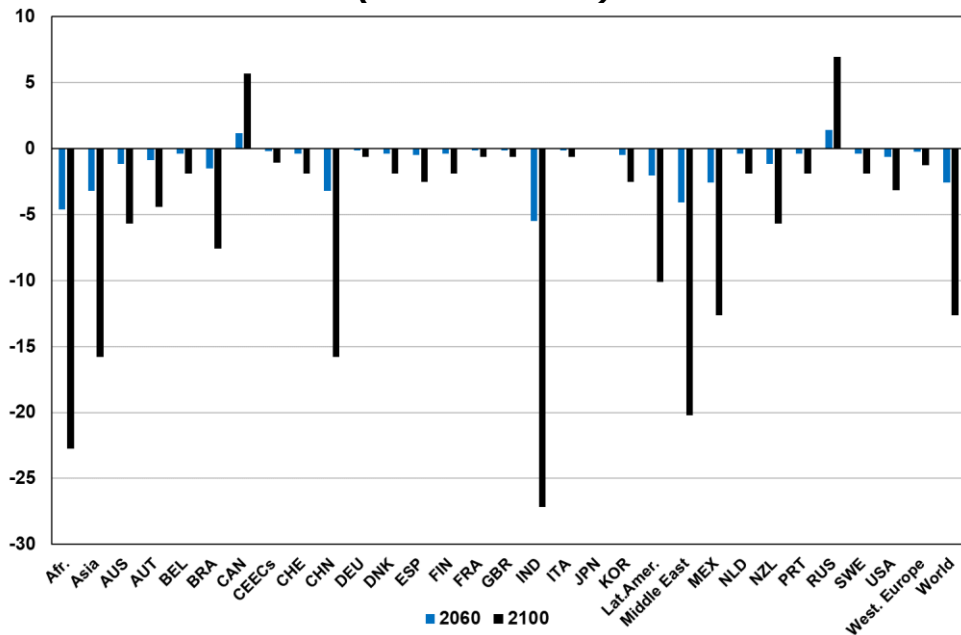
In terms of CO<sub>2</sub> emission, neutrality can be reached only with the HCT scenario, and only in 2100. The temperature rise is above 5°C in the BAU and DREP scenarios, close to 4°C in the LCT scenario and close to 2°C in the HCT scenario

in 2100. Only in the HCT scenario is it possible to come closer to the objectives of the Paris agreement, which aim at containing global warming "well below 2°C compared to pre-industrial levels". The DREP scenario has a limited impact: despite fairly high substitution elasticities between CO<sub>2</sub> emitting and non-CO<sub>2</sub> emitting energies (between 1 and 2), the small proportion of clean energies today limits the gains of such a scenario. Nevertheless, the latter could emerge naturally thanks to technical progress leading to a rapid drop in their production cost, or through the mobilisation of the carbon tax to subsidise their use.

Measured in terms of world GDP (see Chart 1), these results illustrate the challenge of the long term perspective or "tragedy of the horizon": the strategies with the lowest economic damage in 2060 are the absence of climate policy and the DREP scenario, while in 2100, the most favourable scenario in terms of GDP is the HCT scenario, with significant gains compared to the BAU scenario.

Another outstanding fact of this exercise is the unequal distribution of damages, which gives rise to the "tragedy of the commons". The distribution of the damage caused by global warming (see Chart 2), and thus of the benefits of a climate policy that prevents it, is very uneven. Some countries will suffer losses of over 15% of GDP by 2100 (such as China), or even 20% (such as India, some African and Middle Eastern countries). Other areas will suffer limited damage (such as Europe) or even derive exceptional benefits from global warming through the extension of arable land or an increase in agricultural productivity (such as Canada and Russia).

**Chart 2: Highly uneven damage linked to global warming  
(as a % of GDP)**

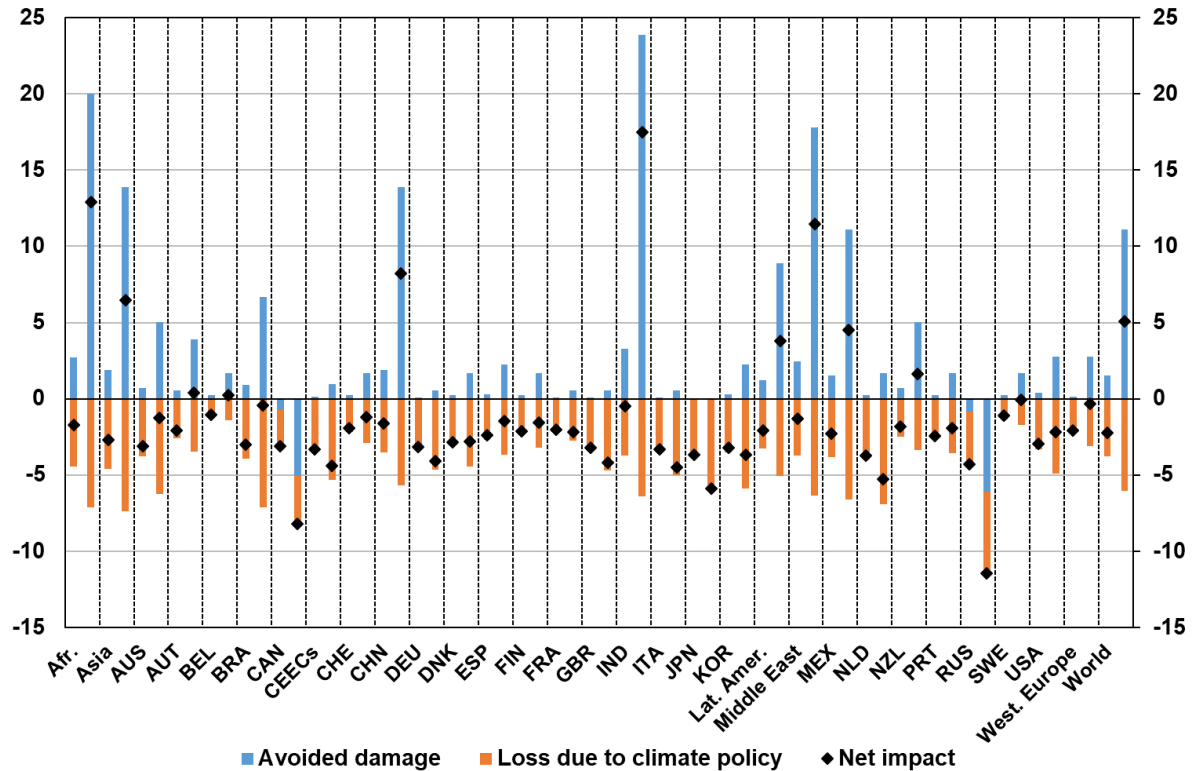


Source: Alestra, Cette, Chouard and Lecat (2020)

Note: Damage as a % of GDP in the absence of climate policy by country and region; ISO country code; Asia, Latin America, Western Europe and Central and Eastern European Countries (CEECs): excluding countries already included (Alestra, Cette, Chouard and Lecat (2020))

This "tragedy of the commons" also appears in the distribution of costs and benefits in the HCT scenario (see Chart 3): while the costs of climate policy are between 1 and 8% of GDP, the benefits in terms of avoided damage vary from over 20% for India and some African countries to a few percentage points for a large number of advanced countries. In total, developing countries record a very significant net gain, while advanced countries (which are nevertheless exposed to damage not accounted for here in terms of health, biodiversity, international conflicts, etc.) record a net (albeit limited) cost. These results highlight a need for international solidarity.

**Chart 3: Costs and benefits of a climate policy in a high carbon tax scenario  
(as a % of GDP relative to the BAU scenario, first bar: 2060, second: 2100)**



Source: Alestra, Cette, Chouard and Lecat (2020)

Note: ISO country code; Asia, Latin America, Western Europe and Central and Eastern European Countries (CEECs): excluding countries already included. Alestra, Cette, Chouard and Lecat (2020)

### Climate policy outlook

These scenarios are a call for action, as the damage by 2100 is significant for some countries. Raising the price of CO<sub>2</sub>-emitting energies is an effective policy for combatting global warming, even if it must be very significant to achieve carbon neutrality and must be complemented by other policies, in particular to enable investors to finance long-term energy projects. Nevertheless, the political decision-making process must take into account both the long term and a certain amount of international solidarity in favour of the most affected countries.

International cooperation is necessary to prevent countries falling back on strategies that only consider their national interest. With the withdrawal of the United States from the Paris Agreement, it now seems difficult to achieve this at the global level.

However, other strategies can be implemented. For example, a "climate club" based on a "coalition of the willing" and reaching a certain critical mass (such

as the "Coalition of Finance Ministers for Climate Action" or the NGFS), could instill an ambitious climate policy and encourage other countries to follow suit. For example, a carbon tax could be introduced at the borders, from which imports that have already paid a similar tax in their country of origin would be exempted. This is one of the paths that the European Union could follow with its "Green Pact".