

Carbon Price Signal

Concept note for the Stern-Stiglitz Commission

Alain Grandjean, Jan 18 2017

1. Many among Heads of States, chief executive officers, and economists, are now sharing the view that a carbon price signal is a must, if we are to achieve the deep changes to the world economy that are required towards the 2°C pathway. The core idea is to incentivize firms and finance into developing and rolling out low carbon investments that will become profitable thanks to carbon pricing.

If credible, the guidance on a future corridor of carbon prices makes the future more secure, and therefore reduces uncertainty. It thus unlocks investment, both through fostering long term commitments, and through reducing the cost of capital. It is also a non-remorse strategy.

It is quite important to insist on the beneficial and catalytic aspect of a carbon price signal, in order to avoid the usual criticism addressed to its punitive characterization. Similarly, it is important to highlight the co-benefits of fighting climate change (in terms of innovation, health preservation, jobs creation, pollution and other externalities reductions¹).

Furthermore, as a matter of fact carbon price signal(s) are included in larger public policy packages or clusters (standards and regulations, public investment policy, public information and training, subsidies, research and development incentives, tariffs, decrease in fossil subsidies,...²) which may widely differ between sectors and countries (see below). The appropriate level of a carbon price signal is therefore primarily dependent on those global public policy designs.

2. A carbon price signal can be seen from different perspectives :

- as reflecting the discounted value of present and future environmental damages ; with this definition, there is only one price, perhaps modulo forex exchange and purchasing power parity adjustments. It is however not possible to compute that price, as this would involve a perfect modelling of the said damages and their values for present and future generations ;

- as an incentive signal to shift behaviors and to reduce GHG emissions ; it then follows that such a price signal could vary between sectors and countries (a USD 50/ton price does not bear the same macroeconomic consequences in Nigeria and in France) ;

¹ Air pollution for dust and nitrogen oxydes, sea pollution for oil exploration, reduction of mining hold on land, water use in coal production, and so on.

² Estimated at USD 500 bn by the OECD.

- as aiming to reflect the cost of emissions to be avoided by a given economic player in order for him to remain on the 2°C pathway : it would then amount to the cost of building up natural capital, retained in this players accounting books.

Depending on which view is taken, the calculation steps of (a) carbon price signal(s) will differ. At the current stage, the incentive view clearly dominates worldwide, which is why most countries have developed mixed carbon policy packages.

3. Paragraph 109 of the Paris Agreement recognizes the social, economic and environmental value of voluntary mitigation actions. Paragraphs 136-137 mention carbon pricing as a domestic policy instrument : « Recognizes the need to strengthen knowledge, technologies, practices, ...also recognizes the important role of providing incentives for emission reduction activities, including tools such as domestic policies and carbon pricing »

4. Following the work of the Alain Quinet Commission, France adopted for the 2010-2030 period, and relative to the years 2010 to 2030 with a 2050 outlook, a time series of « tutelary carbon values », sometimes also called policy price or social carbon value.

This series of values was used in the French Law on the Energy Transition for Green Growth, in order to determine the future evolution of the carbon tax, called « climate-energy contribution », until 2030. More precisely, this « contribution » is an element of the tax on fuels burnt by households and firms. The tax amounts to € 22 per CO₂ ton in 2016 moving to € 56 in 2020, to € 100 in 2030 and to € 100 in 2030. This carbon value is called « tutelary » because the State uses it in its pre-tender assessment of the profitability of public investments, in particular infrastructure investments, as an estimate of the cost of climate change. It is available, although not mandatorily, to the private sector as a reference value for private investment decision- making.

It can be quite useful to encourage countries to define a policy price converging towards worldly recognized values. Such prices could also serve as a calculation basis in the North to ease the flow of finance and guarantees towards low carbon investment.

5 As of today, some 40 countries have implemented a carbon tax or a carbon trading scheme. Prices range³ between a few euros per ton of Co₂ more than 100 (in Sweden, see map below). Except error, IEA's 2016 WEO refers to the following prices (in constant 2015 USD), for the power and steel sectors (plus aviation in the case of the EU, which, besides, includes the UK) :

³ The comparison is not straightforward, since purchasing powers differ between countries, and also because some countries implemented energy taxes which add up to the carbon tax.

- Australia, Canada, Korea, USA, Japan, New-Zealand, EU
\$ 20 in 2020, \$ 100 in 2030, \$ 140 in 2040
- South Africa, Brazil, China, India, Russia :
\$ 10 in 2020, \$ 75 in 2030, \$ 125 in 2040

The WEO 2016 does not mention a carbon tax in the building sector, contrary to Energy Technology Perspectives 2016 which is considering a carbon tax also in the building sector, up to some \$ 150 per ton in 2050.

6. In order to remain on a 2°C pathway, the requirements are to move fast, to handle « political imperfections⁴ » as well as discrepancies between countries and sectors, and to aim at the most realistic options. The same price signal, expressed as a said number of dollars per ton of CO₂, will have quite diverse impacts on various sectors, once translated into dollars per ton of unit of work and in the ratio of cost of CO₂/cost per unit of work (see table attached). For instance, a carbon tax at € 20 per ton of Co₂ amounts to 35% of the price (excluding VAT) of a ton of cement, but 3% of the price of a mWH of power produced in France and sold on the wholesale market in 2014. Besides, low carbon technologies are more or less advanced between various sectors. If a single policy instrument is applied to sectors whose reactions to a price signal may be so diverse, there is a risk of leveling down, with the potentially most impacted sectors lobbying to avert impact. The only way to counter this effect would be to use offset mechanisms, such as free quota allowances, which are well known to be sub- optimal in terms of fighting climate change.

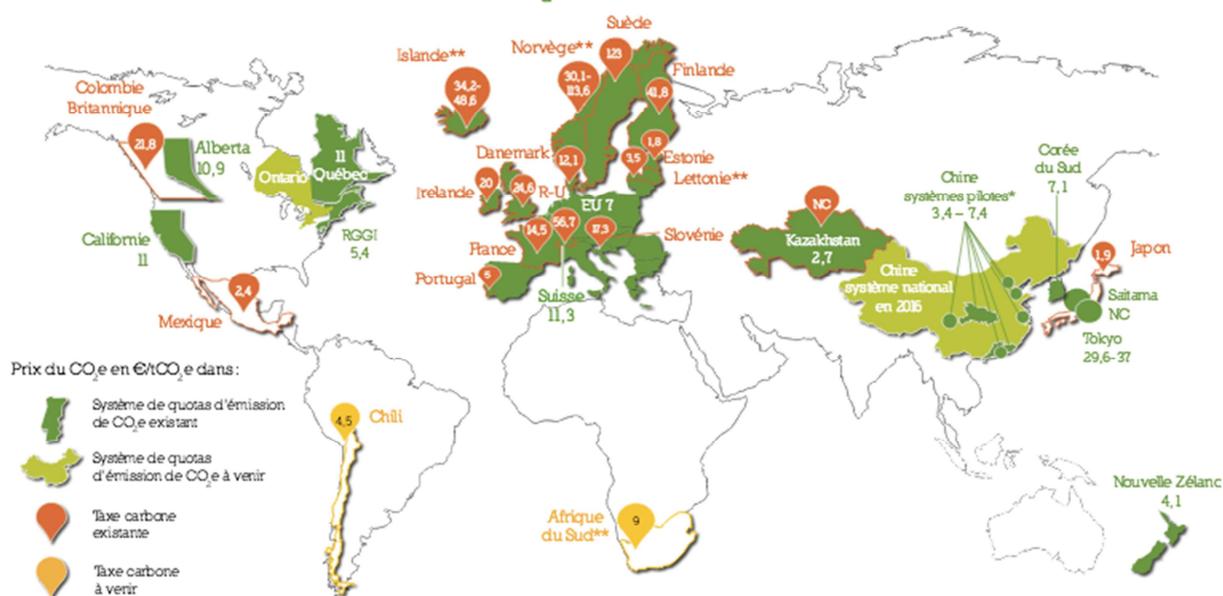
The same remark applies on a regional level : a same price is likely to have widely diverse impacts depending on how economically developed a given country is.

7. Each country or group of countries develops a « cluster of measures » and their own choices of options. It is nevertheless quite useful to highlight the priority levers and the level of carbon prices, which, once the other cluster policies are enforced, will get things moving, either in terms of technological switch or in terms of faster rolling out of the most appropriate technologies and solutions.

Annex : 2015 Carbon prices worldwide

⁴ Which are one of many reasons why implementing the high explicit carbon prices that economists often advocate is quite difficult.

Panorama mondial des prix du carbone en 2015



*Chongqing, Guangdong, Hubei, Pékin, Shanghai, Shenzhen et Tianji
 ** Prix différents selon les secteurs couverts et/ou les produits énergétiques
 Source: IACE - Institute for Climate Economics, juin 2015.