

A Note on Climate Policy Negotiations at the Threshold of COP-21 in Paris¹

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Aim and Scope of this Note

The 2015 United Nations Climate Conference (COP21)² is due to be held in Paris this December. We take this opportunity and provide a brief overview of the current European and international climate policies and the corresponding economic challenges of successful climate negotiations. The issue of climate change is among the biggest challenges facing the earth planet dwellers in the 21st century. The importance of climate protection has been acknowledged in several scientific and policy documents including the United Nations Convention on Climate Change (UNFCCC) and the UN Climate treaty in 1992. The enforcement and extension of declared initiatives following the Kyoto Protocol in 1997 was hoped to be a turning point for international climate policy negotiations and a pathway towards a common commitment via globally binding emission targets. However, history proved otherwise and the Kyoto Protocol experienced a number of drawbacks in ratification and withdrawals on the part of some major industrialized countries (i.e., USA, Japan, Russia and Canada). Meanwhile, the European Union undertook substantial efforts in the implementation of the EU Emission Trading Scheme (ETS). This innovative approach was intended to encourage other countries' proactive behaviour.

However, these aspirations did not materialize in practice, and only 15 % of global emissions were covered in 2012. As a general conclusion of the Kyoto process, Gollier and Tirole (2015) write: "*Sadly enough, the Kyoto Protocol was a failure. Its architecture made it doomed to fail. Non-participating countries benefited from the efforts made by the participating ones, both in terms of reduced climate damages (free-rider problem), and in terms of improved competitiveness of their carbon-intensive industries (carbon leakage)*".

At the threshold of the upcoming COP21 in Paris, the underlying problems of the Kyoto protocol still remain unsolved despite a long and intensive discussion within the scientific community and beyond. At the international level, the free-rider problem is the main barrier to a global

¹ This note was inspired by a workshop on climate economics in Berlin to which the authors contributed in discussions and with a presentation.

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² COP is an acronym used for the annual Conference of Parties.

agreement: all parties benefit from greenhouse gas (GHG) emission reductions, but individual motivation to act is negligible. In other words, at the margin each country bears the full cost of its carbon mitigation measures but the benefits are shared by all. This creates a misalignment between the self-interest and the provision of the common good. The “pledge and review” mechanism based on voluntary actions supported among politicians is not an economically sound solution to the public good problem. As Stiglitz (2015) argues “*in no other area has voluntary actions succeeded as a solution to the problem of undersupply of a public good*”. Only a common commitment in the form of “I will if you will” can solve the problem of the common (Cramton et al., 2015).

At the European level, significant efforts were dedicated to establish the ETS which, irrespective of some criticisms, can be considered the largest multinational climate policy achievement based on a common commitment principle. EU ETS serves as a global benchmark for a market-based climate protection mechanism applied over multiple jurisdictions. The note summarises current major open questions and challenges that have to be solved in the future on the European level.

International level

The economic mainstream solution to the climate problem is that negative externalities of GHG emissions should be priced (internalized) according to the marginal climate damage associated with emissions. As neither place nor origin of emissions affect the marginal damage, all tons of CO₂ should be priced at the same level – regardless of their origin. “*By imposing the same price to all economic agents around the world, one would ensure that all actions to abate emissions that cost less than that price will be implemented*” (Cramton et al., 2015). It is important to note that the economic prescription of pricing carbon does not automatically refer to a particular mechanism (e.g. carbon tax or cap and trade). In economic parlance pricing carbon only implies putting a value on the social cost of emission.

In order to achieve this, there are two main mechanisms currently discussed within the climate policy literature. Both are designed to establish an international agreement based on a common commitment principle. One is a carbon price mechanism; the other is a cap-and-trade mechanism. Gollier and Tirole (2015) describe them as follows:

- ✓ Carbon price mechanisms involve a “*minimum average price by country on all emissions around the world would be agreed upon and collected by individual countries*”;
- ✓ Cap-and-trade mechanisms specify a “*worldwide, predetermined number (the cap) of tradable emission permits. The tradability of these permits would ensure that countries face the same carbon price, emerging from mutually advantageous trades on the market for permits; the cross-country price here would not result from an agreed upon price of carbon, but rather from clearing in this market*”.

There is no universal agreement among economists in favour of a particular mechanism. Instead, a number of arguments supporting one or another position are exchanged among leading experts in the field (interested readers can follow the list of references in this note to find a recent discussion on the advantages and disadvantages of each approach). However, there is one thing

that almost all economists agree upon. Both schemes are of the form “I will if you will”. Furthermore, from a theoretical point of view and under a set of assumptions such as when the various parameters of the climate change equation are known, carbon price and cap-and-trade are equivalent (Gollier and Tirole, 2015). However, in the real world, these two schemes do not coincide perfectly and therefore, the question that which one is easier to implement and most likely to deliver its objectives is open to debate.

Another important point is that a global agreement irrespective of its underlying mechanism must be accompanied by at least three additional components:

- a. Monitoring and verification
- b. Enforcement
- c. Equity transfers (“common and differentiated responsibilities” principle”)

The monitoring and verification process is supposed to deal with, for example, the possibility of corruption on local and national levels or incorrectly reported numbers, such as collected revenues in the case of carbon pricing or distorted emission amounts in the case of a cap-and-trade system. Detailed discussion of this issue can be found in a recent paper by Cramton et al. (2015).

The aim of enforcement mechanisms is to address the free-rider problem. In recent publications of experts on climate policy negotiations including Cramton et al. (2015), Stiglitz (2015), Weitzman (2015), Gollier and Tirole (2015) a number of measures proposed to reduce free-riding incentives. These are for example the usage of an international trading system that applies penalties in the form of border taxes or treats countries’ non-compliance as a sovereign debt, involving organizations such as WTO or IMF. The need for enforcement is also highlighted in the following statement: “*Countries always find a multitude of excuses (choice of other actions such as R&D, recession, insufficient effort by others, commitment made by a previous government, etc.) not to abide by their pledge*” (Gollier and Tirole, 2015).

Furthermore, in order to bring all (or most) countries into a joint action, presence of a mechanism that provides cross-country equity transfers from richer countries (usually characterized by higher emissions) to poorer ones (with lower emissions) is essential. Such a global instrument is the Green Fund which was initiated in the COP15 in Copenhagen. The fund is financed by revenues collected from carbon pricing schemes with the purpose of assisting developing countries to finance expenditures associated with carbon emission abatement costs and to adopt low-carbon technologies. According to Stiglitz (2015): “*The contribution to each of the developing countries from the Green Fund should be large enough to compensate them for accepting the global carbon price*”. He further suggest to allocate 20 % of the revenues earned by developed countries, from the carbon price (or its equivalent), to finance the Green Fund. This would bring the global abatement scheme in line with the principle of “common and differentiated responsibilities”. Other advanced discussions of the Green Fund’s role in a common global abatement system can be found in the works of Cramton et al. (2015) and Gollier and Tirole (2015).

European level

The European Union has currently implemented the world's largest emission trading scheme (EU ETS) covering different countries and jurisdictions. This cap-and-trade system comprises the twenty-eight member states of the European Union plus Norway, Iceland and Liechtenstein.

The first trading period, between 2005 and 2007, was explicitly designed as a trial period, which allowed the EU to gain experience before the Kyoto protocol time frame. The second trading period, between 2008 and 2012, had the objective to achieve the Kyoto protocol's target of 8 % emissions reduction with respect to 1990 levels. By the end of the third period in 2020, the EU aims to cut GHG emissions by 20 %.

- ✓ The EU ETS is a carbon price mechanism designed along the requirements of a multi-national emission reduction treaty described above;
- ✓ is widely utilized across the European nations;
- ✓ is likely to deliver the desired GHG reduction targets for the covered sector.

Nonetheless, there are challenges that the EU ETS has to overcome. These include:

1. Segmentation of emissions market for ETS and non-ETS sectors;
2. Usage of multiple climate policies at the European level;
3. Overlapping of national and European policies;

The segmentation of emissions between ETS and non-ETS sectors is a challenge for achieving the proposed emission targets because around 55 % of the total European emissions come from non-ETS sectors (DEHSt, 2013). For instance, building and transportation sectors are not covered in the EU ETS. Furthermore, non-ETS sectors have different marginal abatement costs, both between sectors and across EU member states, thus making it difficult to have a single price for non-ETS emissions within Europe (Böhringer and Lange, 2013). Nonetheless, the third period of trading newly incorporated additional emission sectors (e.g. aluminium, aviation) as well as other non-CO₂ GHGs (e.g. nitrous oxide and perfluorocarbons).

An additional challenge arises with the implementation of different climate policy instruments on the European level, all primarily focused on GHG emissions reduction. For example, the European Union has adopted a "20-20-20 target" in addition to aforesaid reduction of GHG emissions. The additional targets are (DEHSt, 2013):

- ✓ 20 % share of renewable energy in gross final electricity consumption;
- ✓ 20 % increase in energy efficiency in comparison to a "business-as-usual" scenario.

The problem is that the inconsistency between policy instruments and the policy objectives violates the "Tinbergen rule". The Tinbergen rule states that the number of instruments should be equal to the number of externalities. In the context of EU energy policies, it is not clear whether EU 20-20-20 targets are meant to tackle the same externality as the EU ETS, i.e. global warming through GHG emissions, or other externalities. It is hard to justify these additional targets if

GHG emissions are the only externality. If these instruments are meant to correct other externalities, an assessment is necessary to identify the nature of those externalities and the best way to correct them.

Last but not least, an overlap of national and European policies and instruments can lead to efficiency losses and other challenges, especially if it is executed in an uncoordinated manner. The first question that needs to be dealt with here is the same as at the European level: What are the externalities and what are the instruments? The second question is what repercussions (desired or undesired) the national instruments will have at the European level.

One example where these questions became relevant was the decision of the German government to phase-out nuclear power stations after the Fukushima accident in March 2011. While a majority of the German population was in favour of the phase-out, there were some undesired effects on other countries, e. g. through cross-border electricity flows. Furthermore, it is easy to see that achieving the GHG emission reduction targets becomes more difficult subsequent to the phase-out of CO₂-free electricity generation from nuclear energy. Ellerman et al. (2014) argue in this context: *“While one can debate how much zero-emission renewable energy can substitute for nuclear generation during the phase-out, there will likely be some increased reliance on fossil generation, both natural gas and coal-fired, and consequently an increase in demand for allowances and in the resulting price, implying more abatement from other sources in the ETS including notably outside Germany”*. This is especially relevant on a national level, where Germany pursues a reduction target of minus 40 % until 2020.

A supplementary tax on coal used for electricity generation in the UK can serve as another example for the overlapping of national and European policies. The tax serves as a carbon price floor (CPF) that sets a minimum price related to emissions from fossil fuels. Initially it was adopted on April 1st, 2013, to provide additional incentives to invest in low-carbon power stations. On April 1st, 2015, the CPF was increased from £ 9.54 per tonne to £ 18.08 per tonne of CO₂. This results in a total carbon price paid by UK power stations of more than 30 €/t of CO₂ (including the EU ETS price). Taking into account that the current ETS price is around 8 €/tCO₂, this significantly affects demand and price for emission allowances.

The European Commission debates these issues. The 2030 Energy Strategy for example mentions specific targets for RES shares in addition to emission reduction targets. However, they seem to be implicitly derived from CO₂-emission targets: *“A greenhouse gas reduction target of 40 % should by itself encourage a greater share of renewable energy in the EU of at least 27 %*. The Commission, therefore, proposes that this should be the EU's target for the share of renewable energy consumed in the EU”³. Nonetheless, other issues, for example how national instruments such as the CPF in the UK, can be linked efficiently to the ETS are still open for further research.

³ European Commission (ed., 2014): A policy framework for climate and energy in the period from 2020 to 2030

Conclusions

The major objective in future climate negotiations is to establish a legally binding and firm international agreement on world climate policy. To sum up the facts and arguments discussed within this note (and to a more detailed level in the cited literature), one may conclude that:

- ✓ Climate policy negotiations incorporate the free-rider dilemma;
- ✓ There is no evidence that a “pledge and review” mechanism based on volunteerism will provide a solution to the climate change problem;
- ✓ The crucial issue to achieve a global agreement is to follow an “I will if you will” approach: common commitment is needed;
- ✓ Both carbon price and cap-and-trade mechanisms are based on “I will if you will approach” to tackle global warming. An agreement on either mechanism will be an important achievement;
- ✓ Countries should have flexibility in how to achieve the common targets within their internal national policies, in particular whether it will be a minimum carbon price or an emissions cap;
- ✓ Both mentioned mechanisms will need implementation of additional verification and enforcement mechanisms to avoid cheating and non-compliance with global targets;
- ✓ The Green Fund can be used strategically to achieve a treaty.

Within Europe, the EU ETS proved to be an important climate policy achievement. EU ETS provided valuable insights and lessons for implementation of international market-based climate protection mechanism for many economists, politicians and policy makers all around the world. Furthermore, it remains to be the largest climate protection instruments *agreed on a common commitment principle*. The EU ETS fulfilled the European Kyoto protocol target and will most likely also reach the planned emission reductions for 2020 in covered sectors. However, questions on an efficient linkage of instruments remain open, both on a horizontal level, i.e. between different instruments in Europe, and on a vertical level, i.e. between national GHG emission reduction programmes and the EU ETS.

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