

Climate Finance at COP21 and After: Lessons Learnt

Étienne Espagne

Summary

Finance has emerged in the last few years in and outside the Conference of the Parties (COP) process as a key ingredient of climate policy design. It also appears to be a key sector for structural reform in order to align it with the new low-carbon horizon. This policy brief draws lessons from a discussion platform launched jointly by CEPII and France Stratégie, which welcomed more than thirty contributions on climate finance issues from various experts and citizens in the four months leading to COP21. Both these contributions and the final text adopted by the Parties indicate that the financial question will remain essential in the near future in order to consolidate and nurture the Paris Agreement. In this brief, three directions for future debates are analyzed. First, the equity question remains open, through the financing schemes to guarantee a minimum of \$100 billion in annual transfers to developing countries in the name of the principle of “common but differentiated responsibilities”. The question of an increasing ambition to implement the “Intended Nationally Determined Contributions” through specific financial instruments is also discussed. Finally, the necessary long-term objective of a net decarbonization of the world economy invites us to look for more structural reforms in the financial sector.



1 Introduction

The financing issue has been a key deal breaker at COP21. “Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development” is now an official objective in the Paris Agreement (article two), at the same legal level as the goals relating to global average temperature increase and the adaptation objective.

However, the financing issue will be even more important in the future, because the specifics of many financial schemes and decisions have been put aside for future Conferences of the Parties. To give just a few examples: financial flexibility mechanisms have been introduced in the Agreement, with an implicit reference in the final Decision to the Clean Development Mechanism and the Joint Implementation from the Kyoto Protocol (paragraph 37 of the Decision, with a cross-reference to paragraph four of article six of the Agreement), but they must be detailed in future working groups. An agreement on the methods used for the accounting of financial resources related to the “principle of common but differentiated responsibilities” has been postponed to COP24. The Subsidiary Body for Scientific and Technological Advice is supposed to draw recommendations before that Conference (paragraph 57 of the Decision). Finally, paragraph 108 of the Decision states that the Conference of the Parties “[r]ecognizes the social, economic and environmental value of voluntary mitigation actions and their co-benefits for adaptation, health and sustainable development”; this recognition requires further discussions in order to materialize into specific climate-finance instruments.

Right before the beginning of COP21, in early September 2015, the CEPII and France Stratégie decided to launch a discussion platform on the many strands of research and policy-oriented discussions that aimed at understanding the links between financial and climate issues. This platform hosted more than thirty written contributions from experts and citizens alike, covering nearly all fields of discussion relating to finance and climate issues. This paper takes stock of most of these contributions, and at the same time aims to build an analytical picture of “climate finance at COP21 and beyond”. It is structured as follows: Part 1 reviews a number of climate policy proposals that were discussed in the run-up to COP21 and analyzes them as gravitating around two polar centers: carbon pricing and structural financing reforms. Part 2 analyzes how the inclusion of the financial sector in the analysis of environmental policies initially emerged as an essential feature of the political economy context in the aftermath of the Copenhagen conference of 2009, and then expanded its reach between then and the Paris Conference. Part 3 draws prospective lines for climate finance after COP21, based on an interpretation of the related articles in the final text.

... paragraph 108 of the Decision states that the Conference of the Parties “[r]ecognizes the social, economic and environmental value of voluntary mitigation actions and their co-benefits for adaptation, health and sustainable development”...

2 The emergence of the financing question: the end of a theoretical barrier?

2.1 First-best climate policies and the political economy shock

The question of the best climate policy seems to have been solved a long time ago, at least in pure abstract terms. Carbon emissions are a negative externality. Policymakers should price them (Pigou, 1920), or distribute/sell a limited amount of property rights on them (Coase, 1960), and let the economic agents change their behaviors accordingly without further public interference. This will by itself align the private costs with the social cost of carbon emissions, and more generally the social costs of pollution, biodiversity destruction, etc. By internalizing the negative externality, such a standard public policy aims to compensate for a market failure.

This theoretical approach has been the general strategy of the climate negotiations as well, from the beginning of the UNFCCC¹ up to the Kyoto Protocol² concluded in 1997. It is also at the core of national climate policies, when they exist, and, at the European level, of the European Union Emissions Trading Scheme (or EU-ETS). As Harvard professor Martin Weitzman put it (Wagner, 2015), “Price carbon, cap the flow of emissions, there is no other way out”.

However, meaningful prices or meaningful middle-run caps on emissions, the well-known first-best options for climate policies, although desirable *in abstracto*, are difficult to attain in real life – both in national contexts and, even more so, in international negotiations.

In 2015, 12% of world emissions were covered by carbon markets or carbon taxes (Carbon Pricing Watch, 2015). This in itself does not say anything about the ambition of these pricing systems, the quality of these markets, and how they can solve the supply problem generated by a lack of low-carbon projects. As graph 1 shows, little has been accomplished so far in terms of the level of carbon pricing around the world. First-best climate policy options are thus far from being at optimal equilibrium levels, whether at national or world scales.

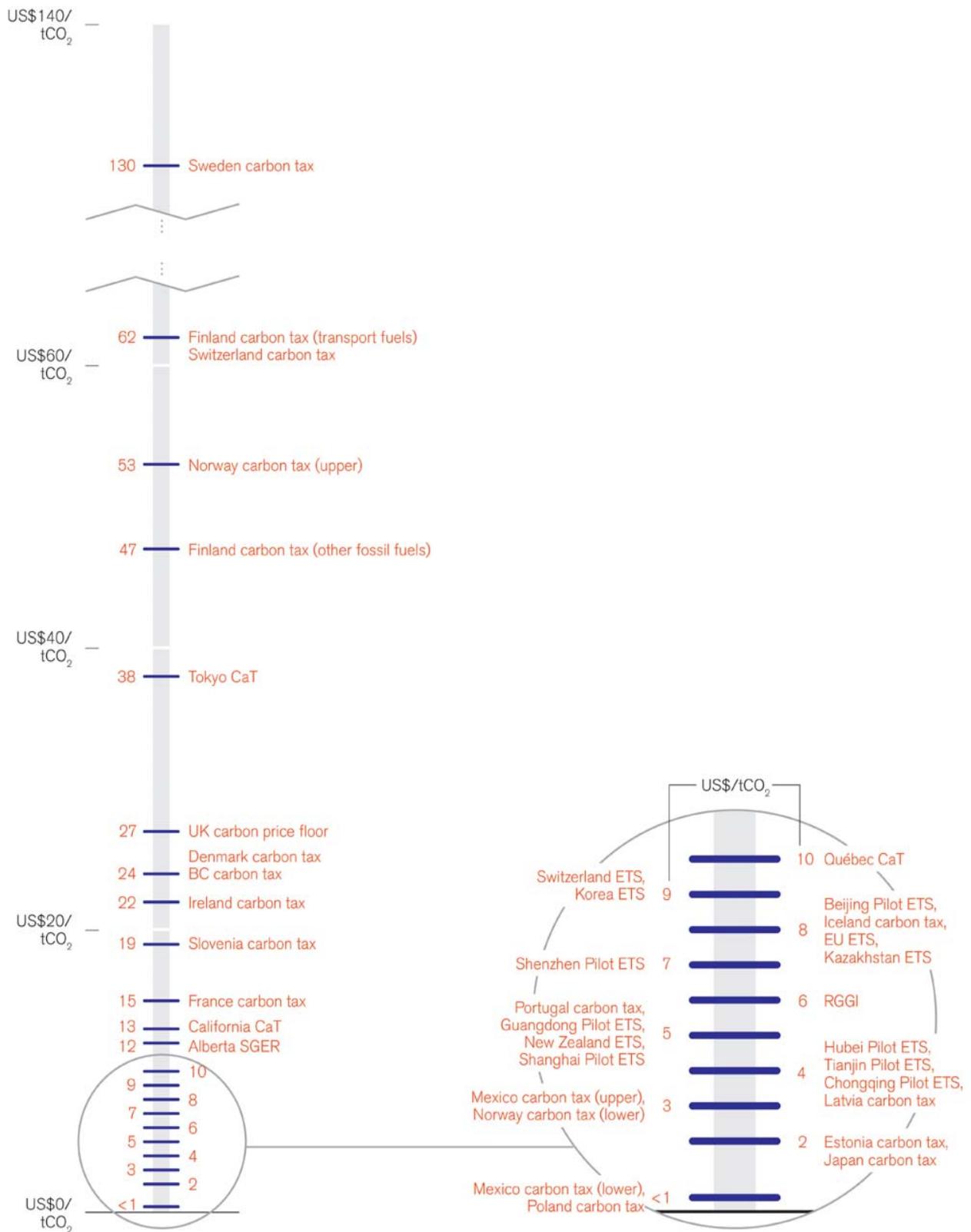
Faced with these disappointing results, two very different strategies concerning climate policy recommendations have prevailed in the run-up to COP21.

(1) United Nations Framework Convention on Climate Change.

(2) The Kyoto Protocol is, so far, the initiative that has come closest to establishing a world carbon market. But it has failed in several respects: by exempting “non Annex 1” (developing) countries, including China, by fixing a non-binding global cap, etc.

Graph 1 – Prices of existing carbon pricing instruments

(on April 1, 2015)



Source: Carbon Pricing Watch, 2015. World Bank Group and Ecofys.

2.2 First option: advocating greater efforts in direct carbon pricing

This first option has been promoted by many scholars and policy analysts, with slight variations around the exact tool to be used and the liberty given to the national level on the exact framing of the climate policy. It can be summarized in terms of an intense debate between the proponents of carbon-tax-related instruments and carbon-market advocates.

Cramton *et al.* (2015) propose international cooperation on a global carbon price as an alternative to the “pledge and review” approach chosen in the COP21³ process. This global price would, however, be freely implemented at the national level. The authors argue that the transfers linked to equity principles are less important than in a cap-and-trade system. Prévot (2015) proposes a pricing on carbon that takes oil prices into account. This amounts to a fully controlled price on energy consumption at the national level. If this proposal does not seem politically realistic in the short run, it underlines a key issue in the current context of low oil prices by linking the oil price to the optimal climate policy. Stiglitz (2015) proposes a moderate carbon price-level mechanism, with some flexibility given to the national level and a fund reallocating 20% of the revenues from carbon taxation to developing countries. Weitzman (2015) considers it simpler to negotiate on a global carbon price rather than negotiating different quantities depending on the countries concerned (which was the Kyoto approach). There might also be a positive effect to a carbon tax since the cost of a carbon price for an economic agent is compensated by the knowledge that everybody else faces the same price, and that climate damages will effectively be avoided.

Gollier and Tirole (2015) propose a pure system of global quantity control (cap and trade), with transfers aimed at solving the equity question (the principle of “common but differentiated responsibility”). The induced transfers would be very important; the failure of the Brazilian proposal for a “clean development fund” in 1998 to implement the transfers in the Kyoto Protocol context is not a positive indication for the concrete realization of such a proposal. De Perthuis and Jouvét (2015) propose a “bonus-malus” system in which global objectives are linked to an average level of emissions, a bonus/malus affecting countries that are below/over that threshold. Both proposal simply the voluntary payment of high fees between countries at the international level, which has very few precedents in history. Green *et al.* (2014) propose a median approach between the “top-down” approach (or unique global agreement), which has failed so far because of political difficulties (disagreements on the scope of the financial transfers), and the “bottom-up” approach (or regional agreements with future

carbon-market connections) by proposing a prudent and progressive connection of regional markets with a special focus on three aspects: the ambition of the emission targets, the control, and the institutional design. This path is also taken by many experts at the World Bank (working groups on “networked carbon markets”).

This is a review of only some of such proposals around global carbon pricing. It must be emphasized that the IMF, the World Bank and the OECD advocate more efforts on carbon pricing. However, reading the details of their research agenda provides a more nuanced and balanced position, as will be developed later. With regard to COP21, the word “carbon pricing” appears only once, in paragraph 136 of the Decision, as a tool among other possible national mitigation instruments.

2.3 Second option: advocating structural reforms in the financial sector, both public and private

The other way of tackling the difficulty of implementing first-best solutions is to work out second, third and fourth-best policy options (Wagner and Weitzmann, 2015), once political constraints, scientific uncertainty, technical innovation, geopolitical shifts, historical and cultural backgrounds, and co-benefits (Stern and Calderon, 2014) are taken into account. In such a world, the global carbon price strategy would even be a counterproductive idea (Godard, 2015). This world is also the place where the financial system, the banking sector and even monetary policy could enter the room, in order to deal with specific transition effects.

If uniform global carbon pricing brings with it the comforting view of a theoretically simply solved problem, the transition process to this new state of the economy could be much messier, as it involves more than taking a new price into account in all economic decisions. As Box 1 illustrates with historical examples, no new technological wave, no innovation transition has ever happened without changes on the financial side.

First, the transition goals require huge investments. Stern and Calderon (2015) summarize in their “finance” chapter these investment needs up to 2030.

The overall infrastructure investment needs by 2030 amount to \$89 trillion, which would “only” increase by 5% in case of a low-carbon trajectory. The situation varies between sectors. In the electricity sector, the impact of a low-carbon transition would even bring

a net benefit of \$1.8 trillion. Second, the destruction of value on most carbonized assets (Coady *et al.*, 2015) induced by the transition must be prepared by policymakers (disincentives for the investments in these sectors). Third, new financial tools, a larger use of development banks, and a more efficient north-south financial channel could reduce the overall cost of transition by 20%.

*... no new technological wave,
no innovation transition has
ever happened without changes
on the financial side.*

(3) See below for a description of this approach.

Box 1 – Schumpeterian waves of innovation

If it is often argued that the climate-change challenge also represents a formidable opportunity for the growth process. This view, which can be deemed “schumpeterian”, sees the long-term growth process as a succession of technology waves. In this view, the next generation of technological innovations might as well be the low-carbon technology wave, as shown in the following table.

Acemoglu *et al.* (2012) see this as a reason to subsidize “low carbon private R&D”, a simplified view of the innovation process that has been criticized in Pottier *et al.* (2014). Mazzucato (2013) shows how the state is a key part of these technology breakthroughs thanks to massive investments in certain sectors that give credibility and certainty for the private sector to follow. But these analyses underplay the role of a third key actor in these transition processes: the financial sector, public and private. In fact, Dasgupta (2015) shows that each one of the historical technology waves has occurred in parallel with a transformation of the financial sector. We can quote the development of the railway system at the end of the 19th century in the United States, which was only possible through the massive leverage effect of the concessions of the lands

around the rail given by the federal state to private investors. Through this financial policy, the state credibly announced the creation of a future value, which had the power to attract enough private financing to realize it in reality. Another example is the Ford T model, which benefited from a long period of cheap credit, as well as the voluntary choice to pay workers a relatively high wage in order to foster greater demand for cars. These examples are very specific to their related historical period, but there is one lesson we can draw from them: it takes more than two actors (the firms and the state) to realize a technological transition process. The financial sector has to be adapted to the new challenge as well, in order to give credibility to a shared view of the future and induce the simultaneous emergence of a demand for projects and a targeted supply of funds. In the case of the low-carbon transition, the credibility issue remains key, as emphasized by Pisani-Ferry (2015). Contrary to Observatoire du long-terme (2015), the simple public announcement of a value for the carbon externality will not suffice to drive investment toward the desired transition. There must be a commitment by all actors, including by the public side, as proposed in Aglietta *et al.* (2015).

Table 1 – Schumpeterian waves of innovation

Innovation source	Emergence	Diffusion	Adaptation crisis	Maturity	Total period
Steam engine and textile	1762-1774	1774-1834	1834-1843	1844-1861	1762-1861
Rail and steel	1831-1847	1847-1888	1888-1895	1896-1917	1831-1917
Mass production	1882-1908	1908-1937	1937-1949	1950-1973	1882-1973
Information and communication	1961-1981	1981-2007	2007-?	??	1961-?
Environment	1972-2015	2015-?	??	??	1972-?

Source: Aglietta and Brand, 2013.

The transition therefore involves a process of value destruction and recreation, which implies a proactive role for both public institutions and finance. This explains why the compatibility of financial flows to the mitigation and adaptation objectives has been recognized as an objective in itself in the Paris Agreement (article two).

We will now examine the rise of this second option in relation to the climate negotiation process.

3 Copenhagen 2009 to Paris 2015 – the rise of climate finance

3.1 From the burden-sharing principle to the Intended Nationally Determined Contributions (INDCs)

Following the Copenhagen conference of 2009, which was supposed to give birth to the new Kyoto Protocol, it has become clear that it was politically extremely hard to agree on a carbon budget for each country that satisfies everyone (Stern, 2015). Such discussions immediately raise ethical issues and issues of self-interest, and tend to reinforce the “prisoner’s dilemma” character of the negotiating process (Espagne, 2015). But, if a global carbon market is off the table in the short to medium run, a unique optimal carbon price is also highly unlikely. Its theoretical advantage, which is to disentangle the carbon externality problem

(the carbon price) from the redistributive issue⁴, is also its main drawback. For the developing countries, a high enough carbon price would impede their development without substantial financial transfers, which developed countries would be less and less likely to deliver, given their ever-tighter budgetary constraints.

In the absence of such a clear common goal, how can the negotiation process still be of any use? All the COPs after Copenhagen in 2009 have tried to answer this difficult question. All the options considered have involved some sort of “climate finance”. We keep the definition very general on purpose. It will be specified in different ways later on. It must be remembered that this finance issue is totally new in the climate debate. Climate finance was absent from the Copenhagen conference, as it was from the landmark Stern report (2007). Still, the final text in Copenhagen creates a promise of \$100 billion of annual transfers from developed to developing countries, from 2020. This promise, confirmed in Cancún in 2010, is certainly the first concrete illustration of the COPs turning to climate finance as their main hope for a global agreement. This shift was reinforced in Cancún, where the Parties officially called for a “paradigm shift” and announced the creation of the Green Climate Fund, a new international financial institution aimed at financing mitigation and adaptation actions, the headquarters of which are located in South Korea.

(4) The theoretical possibility of such a disentangling has also been put into question: see Lecocq (2012).

In subsequent years, this shift generated research on climate finance on a new scale. In the run-up to COP21, all countries were under pressure to formalize their Intended Nationally Determined Contributions (INDCs) to the global mitigation effort. All but eight have done so, covering more than 95% of today's global emissions. The path towards COP21 was also marked by a general involvement of the financial system in the climate negotiation process. The preparation of COP21 involved not only state departments and environmental administrations, but also systematically included finance administrations. In the next period, climate finance will have to be structured so that the Parties can accomplish these voluntary objectives. It will also have to contribute to the creation of a new momentum so that the INDCs can be revised upward more easily⁵. It is no mystery that the national prism chosen for COP21 has emerged as a *pis-aller* for a global agreement: the practice of climate finance has its roots in local and varied initiatives all over the world.

3.2 Local initiatives as a dress rehearsal for global technical agreements on climate finance?

Local initiatives have for some time been applying innovative financing tools for the low-carbon transition. We will list here just a few examples of policies adopted by both developed and developing countries, taken from the in-depth analysis of the UNEP Inquiry (2015) and its related country reports.

In Germany for example, the KfW (Kreditanstalt für Wiederaufbau) has directed more than 40% of its domestic investments toward climate policies since 2012. Its tools are a federal guarantee that allows low-carbon projects to be financed with very low rates of interest, and direct subsidies in certain programs, such as building insulation. In the United Kingdom, the Green Investment Bank (GIB) achieves a leverage ratio of three to one (for every £1 that it invests, it attracts £3 from other private-sector investors). Bank of England governor Mark Carney has suggested that the quantitative easing policies of central banks could be targeted toward green bonds. The balance sheet of the KfW is greater than that of the European Investment Bank (€511bn and €508bn, respectively), which is itself much greater than that of the GIB. In France, the climate finance ecosystem has evolved very rapidly in the past few years, and even months (Morel and Cochran, 2015). Very recently, the energy transition law has laid down (article 173) that French financial institutions should evaluate the environmental impact of their balance sheet. The 2° Investing Initiative (2015) has analyzed in depth the feasibility of this article. At the local level, discussions have also emerged on the possible use of complementary currencies to foster low-

(5) The current INDCs trend would put the world on track for a temperature increase of at least 3°C, which is deemed dangerous by the scientific community.

carbon projects without inducing the so-called “rebound effect” (Kalinowski, 2015).

In developing and emerging countries, situations are very varied. We can cite three innovative countries regarding climate finance: China, Bangladesh and the Republic of Côte d'Ivoire. UNEP Fi (2015) proposes concrete steps for the realization of the official objectives of the Chinese government. It appears that China has already set in motion several specific investment vehicles to target credit creation toward low-pollution/low-carbon investments. It is likely to intensify such measures in the near future. Barkawi and Monnin (2015) analyze Bangladesh Bank's sustainability policy. Its mandate is to “[stabilize] domestic monetary value and [maintain] a competitive external par value of the Bangladesh Taka towards fostering growth and development of [the] country's productive resources in the best national interest”. The bank prioritizes growth over inflation as long as the latter remains tolerable. In addition, it emphasizes the important role that central banks play in pursuing sustainability priorities, including poverty alleviation and environmental stability. This approach has been confirmed by the senior adviser to the governor of the Bangladesh Bank (Kazemi, 2015). Finally, the Republic of Côte d'Ivoire has engaged positively in the climate diplomacy process since its beginnings, and manages to navigate between ambitious climate goals and the objective to reach the status of an emerging

country by 2020. It emphasizes the need to develop technology transfers and the insufficient level of the \$100 billion figure compared to developing countries' needs (Niale Kaba, 2015). From these country-specific descriptions emerges a landscape of varied climate policies and proposals at the local level, depending *inter*

alia on the state of economic development, the specific financial culture of the country, and the articulation between local and national democracy. A wide range of factors explain the concrete difficulties in achieving a global carbon price, and in drawing the map of a complex system of localized mitigation and adaptation actions. If the practice of climate finance has its roots in local experiences, the last few months have also seen the subject being taken to the fore by international financial institutions.

3.3 The international financial institutions and the related monetary debates

Financial actors, both public and private, have led a wave of research and official announcements on climate-related issues in the run-up to COP21. Most recently, the G20 asked the Financial Stability Board (FSB), presided over by Bank of England governor Mark Carney, to investigate the possibility of voluntarily disclosing climate-related financial risks in portfolios. Earlier in 2015,⁶ Mark Carney made a seminal speech on the different

(6) See Box 2 on Mark Carney's speech at Lloyd's in London on 29 September 2015 on the links between climate change and financial stability.

Box 2 – Climate change as a systemic risk for the financial system

In his speech at Lloyd's in London on 29 September 2015, Bank of England governor Mark Carney underlined three key channels through which climate change can affect financial stability:

- the physical risk: impacts on the value of financial assets of climate events such as floods, storms, *etc.*;
- the liability risk: impacts of lawsuits by those who might have been victims of natural disasters that they would try to link to climate change, aimed at those deemed responsible for these changes;
- the transition risk: the financial risk that would result from an adjustment to a decarbonized economy. Changes in policies, technologies, institutions and behaviors might lead to a new valuation of a whole set of assets once costs and benefits of climate action become more and more apparent.

Each one of these cases induces a certain type of impact on the financial system and as a consequence on the real economy. These risks justify the incorporation of some kind of climate policy in monetary policy, not as a direct actor of the low-carbon transition, but as part of its mission of ensuring that the financial system be resilient even when confronted with a chosen or a forced low-carbon transition, and as a facilitator of the emergence of efficient financing tools. The first mission is fulfilled through a transparency policy, the sharing of information (such as the mandatory disclosure of article 73 in the energy transition law in France). It aims at facilitating informed decisions by actors in the financial system.

The second mission is more proactive, and can be understood in different ways. We can understand Carney's argument in a minimalist way, by saying that central banks and financial regulators should encourage private finance institutions to engineer the tools required to help financial flows target specific low-carbon projects. Andersson, Bolton and Samama (2015) show that it is possible to create low-carbon financial indexes that have the same return as the "benchmark" index, which is indifferent to the environmental constraint. By investing in such an index, investors have at their disposal a "free option on carbon", which hedges its return against a possible limit on emissions, a non-negligible probability in the medium or long run. Liebreich (2014) shows that a form of securitization of low-carbon projects, the "big green bucket", could increase loans independently from the carbon price, and reduce the balance sheet of public investment banks.

But Mark Carney's argument that the simple existence of financial tools driven toward low-carbon investments could by itself create enough demand for low-carbon funds is not convincing enough; the doubt is reinforced by his use of the metaphor of the fallacious Say's law. However, his argument that a virtuous cycle should be created, so that firms, financial actors and governments move ever closer to the 2°C goal, is very thoughtful, with the rather provocative idea that climate policy should be conducted more as a sort of monetary policy than as the simple expression of an externality. Monnin (2015) shows how monetary policy already unintentionally drives a sort of climate-oriented policy, through the use of very low interest rates.

sources of financial risks possibly induced by climate change. A financial regulation debate ensued, directly involving actors such as central banks and prudential policy actors. Villeroy De Galhau (2015) underlines this new field of expertise for central banks while showing a willingness to keep central banks out of specific sectoral debates, in line with Pizer (2015) who advocates maintaining "transparency and balance in public policy".

It appears more and more clearly also to the civil society movement that finance is not neutral vis-à-vis the climate issue. This was represented during the Paris Conference by the Solution COP21 platform, and is epitomized by the larger "divestment movement", which calls for the end of fossil-fuel subsidies around the world. These subsidies represent in effect the equivalent of a highly negative carbon price. The OECD (2015), more generally, has analyzed how the regulatory and institutional framework of most developed societies includes biases towards a carbonized society. It proposes a number of marginal changes outside the usual carbon price debate, which could contribute to aligning public policies with the climate policy goals. Its analysis of the financial sector is particularly relevant in this regard.

These diverse initiatives among the international financial institutions and the debates around their underlying principles show that the theoretical issues at stake are still probably inadequately structured or understood. Van Tillburg (2015) sees climate change as a source of systemic risk for the financial system. He thus goes further than Mark Carney, since this

approach implies specific macroprudential policies. Aglietta and Espagne (2015) insist on the political economy factor as a key justification for specific non-conventional monetary policies targeted at low-carbon projects. This goes hand in hand with Sirkis (2015): giving a value to emission reductions could pave the way to creating new types of financial assets that could then be bought by long-term investors, development banks, *etc.* – or central banks in the context of their non-conventional monetary policy. Fankhauser (2015) best summarizes the structural reasons for which specific investment tools are needed to create "an investment climate for climate investment": low perceived risk-return profiles, regulatory and behavioral barriers in the financial sector, and the political economy context.

4 COP21 and beyond

4.1 The Paris Agreement, basic common principles for future action on climate finance

The implementation of the Paris Agreement and the more general Paris Alliance have the difficult task of making the diversity of initiatives globally coherent, with aggregate emission pathways consistent with "holding" the increase in the global average temperature to well below 2°C above preindustrial levels, and pursuing efforts to limit the temperature

increase to 1.5°C above preindustrial levels”. The text of the Agreement recognizes (article two) the objective of “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development” at the same level as the more traditional mitigation and adaptation objectives. This is the main innovation regarding finance in the Agreement. However, all the specifics are either contained in the Decision, which has not the same legal power, but has the advantage of being potentially revised each year, or postponed to specific future Conferences.

In order to materialize the objective to “reach global peaking of greenhouse gas emissions as soon as possible”, which should lead to “achiev[ing] a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” (article four of the Agreement), the strategy of Nationally Determined Contributions (NDCs) is confirmed and institutionalized. But only very ambitious revisions (each five years starting in 2020) could help fill the gap between the national pledges and the mitigation objective stated in the Decision. Flexibility mechanisms to allow emission reductions to be traded among countries, in fulfillment of their national pledges, are proposed, but further details are lacking.

The clear separation of developed and developing countries, which was the backbone of the Kyoto Protocol, still exists in the Paris Agreement with regard to the financial transfers related to the “principle of shared but differentiated responsibilities”. Article nine of the Agreement takes stock of this obligation for developed countries, but also allows developing countries to contribute, on a voluntary basis. There is, however, no mention in the main text of the \$100 billion pledge of annual transfers to be reached by 2020. The number only remains in the Decision (paragraph 53, which refers to paragraph three of article nine of the Agreement), and is considered as a minimal threshold to be crossed before 2025. The decision on the methods of accounting for these financial flows – which provoked a controversy during COP21 through the OECD-CPI (2015) report and the reply by Dasgupta (2015) from the Indian ministry of finance – is postponed to COP24, where the Parties will have to follow the recommendations of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC (paragraph 57 of the Decision).

Finally, the recognition (paragraph 108 of the Decision) by the Conference of the Parties of “the social, economic and environmental value of voluntary mitigation actions and their

co-benefits for adaptation, health and sustainable development” opens the door to positive carbon-pricing mechanisms, such

as in Aglietta *et al.* (2015). It also involves recognition of the need for a dual approach to carbon pricing: not only pricing emissions, but also valuing emission reductions.

These short parts of the Decision and the Agreement in Paris give us hints on the directions that climate finance could follow in the future. More specifically, it could help to increase the ambition and concrete realization of the INDCs; it could also be an integral part of the structural

reforms needed to reach the long-term objective of zero-net emissions (or carbon neutrality).

4.2 The INDCs and the post-COP21 financial reform agenda

The Intended Nationally Determined Contributions system is far from effective in itself, mostly because it relies on the willingness of each individual country to engage in mitigation or adaptation policies, and involves no real accountability. It surely could easily be transformed back into a business-as-usual scenario where we keep heading toward a potential +4°C world, or even worse. But it also builds the institutional structure needed to strengthen a project-oriented climate policy, where the co-benefits of emission reductions are evaluated where they are best known, which is at the national level (Stern 2014; Hourcade *et al.*, 2005). In brief, it allows for a sort of endogenous low-carbon transition in each country, while the unique carbon price or cap-and-trade system remains the long-term objective. A reformed financial system will have a crucial role to play in this INDC framework for at least two reasons.

First, between the stated goal of an average temperature increase lower than 2° (or even heading towards 1.5°) and the sum of all INDC contributions, there will inevitably be a gap, even with the possibility of subsequent revisions. IEA (2015) thus proposes a “bridge scenario” to fill this gap with the help

of innovative financial tools.

The main idea is that parts of the costs from climate action today can be postponed with the help of climate finance to a future where climate benefits will become more evident. Such financial tools require a very strong “Monitoring, Reporting and Verifying” (MRV) system in

order to be environmentally reliable and credible. Bellassen *et al.* (2015) summarize the state of knowledge in this respect, with the question of the scale of application, the uncertainty of measure,

The text of the Agreement recognizes (article two) the objective of “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development” at the same level as the more traditional mitigation and adaptation objectives.

The Intended Nationally Determined Contributions system is far from effective in itself, mostly because it relies on the willingness of each individual country to engage in mitigation or adaptation policies, and involves no real accountability.

and the arbitrages between cost and uncertainty, and between precision of information and comparability.

The second reason why an extended INDC system is meant to go hand in hand with the development of new financial tools is the equity question. So far, this question has been reduced to the \$100 billion question from the Copenhagen Conference, and the creation of the Green Climate Fund. But it could go well beyond these two limited devices. The \$100 billion per year goal of North-South financial transfers is the smallest common denominator that could be reached *in extremis* at the Copenhagen Conference in 2009. It is still a crucial condition to keep the developing countries on board, as we have seen in Paris. But developed countries still have to prove that the \$100 billion is credible at the horizon of 2020. The OECD/CPI (2015) report shows that, of the \$100 billion promised, \$54 billion was already financed, on average, in 2013-2014. But the accounting method stirred huge debates in the months before COP21, with political replies by South Africa as well as analytical responses by India (Dasgupta, 2015).

In fact, this \$100 billion number is very generic. It can involve a mix of public and private finance; it can target adaptation or mitigation projects; it can be channeled through development banks or the Green Climate Fund (GCF). Counting these transfers raises a whole new issue, of tremendous diplomatic importance. The GCF is dedicated to this type of transfer, but has so far been endowed with less than \$10 billion in capital.

The credible development of the INDCs could go hand in hand with a broader use of the GCF (Kroll, 2015). Europe has an interest in fostering the financial transfers through this fund, as well as being proactive in its own climate policy positions (Wolff and Zachmann, 2015; Lepetit, 2015; Moscovici, 2015).

4.3 Deep decarbonization as the backbone of a new financial order?

Taking a larger view, the link created by the Paris Agreement between finance reform and the climate question can be viewed as a first step toward a more ambitious reform of the international monetary system (Dron, 2015), which would build on the officially stated objective of long-term carbon neutrality (Haas, 2015).

Bredenkamp and Patillo (2010) were the first to envisage a financial mechanism to increase the financial power of the Green Climate Fund up to the \$100 billion objective before 2020, mostly through the use of special drawing rights (SDRs) and a repartition key corresponding to voting rights at the IMF. This was rejected at the time, but the idea grew among different groups. In fact, if the long-term goal of climate

policy is a complete decarbonization of economies, or a deep decarbonization pathway (Sachs and Tubiana, 2015), while retaining ambitious development objectives, structural reforms are needed in the financial sector, and a reformed international monetary system can only give a major role to the global externality of climate change.

Canfin and Grandjean (2015) propose a “carbon price corridor” at worldscale. They take stock of the fact that multiple carbon prices already exist at the national levels (implicitly through subsidies to renewable or R&D or explicitly in some sectors), without a common message at the international level. The sectoral and geographical flexibility allowed by the corridor (from \$15 to \$20 in 2015, from \$60 to \$80 in 2030) would better adapt to different development steps and industrial specializations, while keeping a strong common message at worldscale (or at the level of a group of countries). This proposal is close to the Carbon Pricing Leadership Coalition, launched by a club of local and national governments as well as

businesses who voluntarily engage in coordinated carbon pricing policies. It is also close to the idea of giving a reference signal on a long-term carbon price, which could be adjusted slightly differently in different national contexts.

In this sense, the proposal comes close to the debates initiated by EPE-Cired (2014), Aglietta *et al.* (2015) and Aglietta and Espagne (2015). They develop at different spatial scales the idea that defining and using a social and economic value for carbon that could

... the idea that defining and using a social and economic value for carbon that could temporarily differ from the carbon price could be used as a pivot to accelerate the low-carbon transition process, by focusing the climate policy goals on the quality of new investments.

temporarily differ from the carbon price could be used as a pivot to accelerate the low-carbon transition process, by focusing the climate policy goals on the quality of new investments. This concept of a social and economic value of carbon emission reductions, long used by economists, has only recently popped up in the political discourse: in the “positive carbon pricing” proposal in the Brazilian position at the Lima conference, 2014; in the joint statement of Dilma Rousseff and Barack Obama on climate change on 30 June 2015, and in paragraph 108 of the final Decision of the Parties in Paris which was jointly proposed by Brazil and the G77. It could mean, for instance, that certain governments may want to commit to a certain target value for carbon and anchor investment decisions early on, while only gradually shifting production and consumption patterns. This would help to circumvent the difficulty of a rising carbon price now, which would prove impossible as it would hurt massive vested interests too directly. The approach is also politically known as the “positive carbon pricing” principle (Sirkis, 2015), which makes it much more appealing to policymakers than the idea of constraining their economy or reducing their competitiveness through new production costs.

5 Conclusion

This CEPII–France Stratégie climate-finance platform helped to open the debate on crucial issues in the months leading to COP21. It is now clear that, for many different reasons, giving a price to carbon emissions, although extremely important *per se*, will not suffice (Dron, 2015). Carbon pricing will remain an important tool to foster the structural changes needed in the next period, but many more tools will be called for (De Perthuis, 2015b). For the challenge is not limited to internalizing a simple externality, but to overcome the intricate links between climate policies and development issues (LCS-RNet, 2015; Edenhofer *et al.*, 2015), between climate policies and social and redistributive issues (Hines, 2015), between climate policies and the growth imperative (Loorbach and Huffenreiter, 2015).

Among the four roadblocks identified by Pisani-Ferry (2015) as key pillars for a global climate agreement in Paris, two of them have been partially circumvented: skeptics have apparently been convinced (even the United Arab Emirates have proposed their INDCs), and the free-riding problem is mitigated due to the universal characteristic of the Agreement. But two other roadblocks remain to be fully cleared: the distributional issue has been mostly postponed, and we only have the promise of proper instruments to reach the ambitious mitigation objectives of article two of the Agreement. A long-term public commitment on the future value of the carbon externality (Finon, 2015), as suggested in paragraph 108 of the Decision, on which private and public financial institutions could build innovative financing instruments, could be our better hope of bridging the wide remaining gap.

References

- 2° Investing Initiative (2015). Decree Implementing Article 173-VI of the French Law for the Energy Transition. Challenges and first recommendations. Briefing Note.
- Acemoglu, D., Aghion, P., Bursztyn, L., & Hémous, D. (2012). The Environment and Directed Technical Change. *American Economic Review*, 102(1): 131–166.
- Aglietta, M., & Brand, T. (2013). Un new deal pour l'Europe. Odile Jacob.
- Aglietta, M., & Espagne, É. (2015). Financing energy and low-carbon investment: public guarantees and the ECB. CEPII Policy Brief 2015-06, 2015, CEPII.
- Aglietta, M., & Espagne, É. (2015). More Political Economy on Global Warming – Plus a Proposition. CEPII-France Stratégie Climate Finance Platform.
- Aglietta, M., Espagne, É., & Fabert, B. P. (2015). Une proposition pour financer l'investissement bas carbone en Europe. La note d'analyse de France-Stratégie.
- Aglietta, M., Aussilloux V., Espagne, É., & Fabert, B. P. (2015). How could we finance low-carbon investment in Europe? CEPII-France Stratégie Climate Finance Platform.
- Andersson, M., Bolton, P., & Samama, F. (2014). Hedging Climate Risk. Columbia Business School Research Paper, 14-44.
- Barkawi, A., & Monnin, P. (2015). Monetary policy and sustainability—the case of Bangladesh. CEP: Zurich.
- Bredenkamp, H., & Pattillo, C. (2010). IMF Staff Position Note: Financing the Response to Climate Change. SPN10/06.
- Bellassen, V., Stephan, N., Afriat, M., Alberola, E., Barker, A., Chang, J. P., & Foucherot, C. (2015). Monitoring, reporting and verifying emissions in the climate economy. *Nature Climate Change*, 5(4), 319-328.
- Bouzidi A., & Mainelli M. (2015). Environmental Policy Performance Bonds, CEPII-France Stratégie Climate Finance Platform.
- Canfin, P., & Granjean, A. (2015). Mobiliser les financements pour le climat. Paris. <http://www.elysee.fr/communiqués-de-presse/article/rapport-mobiliser-les-financements-pour-le-climat-de-pascal-canfin>.
- Coady, D., Parry, I., Sears, L., & Shang, B. (2015). How Large Are Global Energy Subsidies? IMF Working Paper.
- Coase, R. H. (1960). The Problem of Social Cost. *Journal of Economic Literature*, 3, 1.
- Cramton, P., Ockenfels, A., & Stoft, S. (2015). An international carbon-price commitment promotes cooperation. *Economics of Energy & Environmental Policy*, 4(2), 51-64.
- Damian, M. (2015). Le Financement des « Pertes et Préjudices » et Dommages aux Pays Vulnérables. CEPII-France Stratégie Climate Finance Platform.
- Dasgupta, D. (2015). Financial Innovation and the State – Lessons for 21st century climate finance from the 19th century railways era. CEPII-France Stratégie Climate Finance Platform.
- Dasgupta, D., Rajasree Ray, S., & S. Shyamsunder Singh (2015). Climate Change Finance, Analysis of a Recent OECD Report: Some Credible Facts Needed. Climate Change Finance Unit, Department of Economic Affairs, Ministry of Finance, Government of India.
- De Perthuis C., & Juvet P.-A. (2015). The 100 billion dollar a year question. CEPII-France Stratégie Climate Finance Platform.
- De Perthuis C., & Juvet P.-A. (2015). The Price of Carbon: Moving Forward in the Aftermath of COP21. CEPII-France Stratégie Climate Finance Platform.
- Dron D. (2015). Donner un prix au carbone ne suffira pas. CEPII-France Stratégie Climate Finance Platform.
- Dron D. (2015). Comment le système financier pourrait-il financer la transition écologique ? CEPII-France Stratégie Climate Finance Platform.
- Edenhofer O., Steckel J. C., & Jakob M. (2015). Climate Finance in the context of Sustainable Development. CEPII-France Stratégie Climate Finance Platform.
- EPE-CIRED (2014). Transition to a low-carbon society and sustainable economic recovery, a monetary-based financial device; http://www.centre-cired.fr/IMG/pdf/concept_note.pdf
- Espagne E. (2015). Les clubs climatiques et la COP21 : ennemis d'aujourd'hui, alliés de demain? La lettre du CEPII n°358, November 2015, CEPII.
- Fankhauser S. (2015). An investment climate for climate investment. CEPII-France Stratégie Climate Finance Platform.
- Finon D. (2015). Pour la reconnaissance d'une valeur sociale du carbone dans l'accord Climat. CEPII-France Stratégie Climate Finance Platform.
- Godard O. (2015). Un prix mondial unique pour le carbone ? Une fausse bonne idée. CEPII-France Stratégie Climate Finance Platform.
- Gollier, C., & Tirole, J. (2015). Negotiating effective institutions against climate change. *Economics of Energy & Environmental Policy*, 4(2), 5-28.
- Green, J. F., Sterner, T., & Wagner, G. (2014). A balance of bottom-up and top-down in linking climate policies. *Nature Climate Change*, 4(12), 1064-1067. Haas A. (2015). Towards a Sustainable Financial System. CEPII-France Stratégie Climate Finance Platform.

- Hines C. (2015). The Role of International Financial Institutions, Central Banks and Monetary Policies in the Low-Carbon Transition. CEPII-France Stratégie Climate Finance Platform.
- Hourcade, J. C., Mathy, S., & Shukla, P. R. (2005). Cutting the Climate-Development Gordian Knot: Economic options in a politically constrained world. In *The design of climate policy*.
- IEA (2015). Energy and climate change. *World Energy Outlook special report*, OECD, Paris.
- Kalinowski W. (2015). Investir dans la Transition Ecologique en limitant les Effets Rebonds. CEPII-France Stratégie Climate Finance Platform.
- Kazemi, M. A. M. (2015). Reorienting Financial Intermediation Towards Sustainable Financing: Bangladesh Bank's approach. CEPII-France Stratégie Climate Finance Platform.
- Kroll, M. (2015). Financing the Green Climate Fund. CEPII-France Stratégie Climate Finance Platform.
- LCS-RNet (2015). A Moment of Truth for the Climate and Sustainable Development. CEPII-France Stratégie Climate Finance Platform.
- Lecocq, F., & Hourcade, J.-C. (2012). Unspoken ethical issues in the climate affair: Insights from a theoretical analysis of negotiation mandates. *Economic Theory* 49, 445-471.
- Lepetit, M. (2015). A 120 billion investment programme for the European Union's three year Juncker Plan. CEPII-France Stratégie Climate Finance Platform.
- Liebreich, M., & Louw, A. (2014). Big green bucket: towards a large-scale refinance facility for clean energy debt. *Bloomberg New Energy Finance White Paper*.
- Loorbach D. A., & Huffenreuter R. L. (2015). Trillions in Transition: Growing our Way out of Climate Change? CEPII-France Stratégie Climate Finance Platform.
- Mazzucato, M. (2013). *The Entrepreneurial State: Debunking public vs. private sector myths* (Vol. 1). London, UK: Anthem Press.
- Monnin P. (2015). Supporting the Energy Transition: The Role of Low Interest Rates. CEPII-France Stratégie Climate Finance Platform.
- Morel R. & Cochran I. (2015). Thinking "Eco-systemically" to shift the Trillions. CEPII-France Stratégie Climate Finance Platform.
- Moscovici P. (2015). Changement climatique : le secteur financier face aux trajectoires 2°C – Discours. CEPII-France Stratégie Climate Finance Platform.
- Observatoire du long-terme (2015). Transition through innovation; how innovation can contribute to building a low carbon economy at an affordable cost. Report for R-20 Regions for climate actions.
- OECD (2015). "Climate finance in 2013-14 and the USD 100 billion goal", a report by the Organisation for Economic Co-operation and Development (OECD) in collaboration with Climate Policy Initiative (CPI).
- Pigou, A. C. (1920). *The Economics of Welfare*. Palgrave Macmillan.
- Pisani-Ferry, J. (2015). Four Roadblocks to a Global Climate Agreement. CEPII-France Stratégie Climate Finance Platform.
- Pisani-Ferry, J. (2015). Why Finance can Save the Planet. CEPII-France Stratégie Climate Finance Platform.
- Pizer W. (2015). Guideposts for Low-Carbon Finance. CEPII-France Stratégie Climate Finance Platform.
- Pottier, A., Hourcade, J. C., & Espagne, E. (2014). Modelling the redirection of technical change: The pitfalls of incorporeal visions of the economy. *Energy Economics*, 42, 213-218.
- Prévoit H. (2015). Les prix à la consommation des énergies fossiles : levier pour une action publique en faveur de la réduction des émissions de CO2. CEPII-France Stratégie Climate Finance Platform.
- Sachs, J., Tubiana, L., Guerin, E., Waisman, H., Mas, C., Colombier, M., & Schmidt-Traub, G. (2015). Pathways to deep decarbonization. Interim 2014 report, Deep de-carbonization pathways project, UN Sustainable Development Solutions Network and Institute for Sustainable Development and International Relations, New York and Paris.
- Sirkis, A. (2015). Positive Pricing of Carbon Reduction: A Low Hanging Fruit. CEPII-France Stratégie Climate Finance Platform.
- Stern, N. H. (2007). *Stern Review: The Economics of Climate Change* (Vol. 30). London: HM Treasury.
- Stern, N., & Calderon, F. (2014). Better Growth, Better Climate: The New Climate Economy Report. The Synthesis Report.
- Stiglitz, J. E. (2015). Overcoming the Copenhagen failure with flexible commitments. *Economics of Energy & Environmental Policy*, 4(2), 29-36.
- UNEPFI (2015). Establishing China's green financial system. People's Bank of China and UNEP Inquiry: Design of a Sustainable Financial System. Retrieved from <http://www.unepfi.org/fileadmin/communications/EstablishingChinasGreenFinancialSystem.pdf>.
- UNEP Inquiry (2015). The financial system we need; aligning the financial system with sustainable development. Report. United Nations Environment Program.
- Van Tillburg R. (2015). What Role for Financial Supervisors in Addressing Systemic Environmental Risk? CEPII-France Stratégie Climate Finance Platform.
- Villeroij De Galhau F. (2015). Changement climatique : le secteur financier face aux trajectoires 2°C – Discours, CEPII-France Stratégie Climate Finance Platform.
- Wagner, G., & Weitzman, M. L. (2015). Climate shock: the economic consequences of a hotter planet. Princeton, NJ: Princeton University Press.
- Weitzman, M. (2015). Internalizing the climate externality: Can a uniform price commitment help? *Economics of Energy & Environmental Policy*, 4(2), 37-50.
- Wolff, G. B., & Zachmann, G. (2015). European climate finance: securing the best return. *Bruegel Policy Brief ISSUE 2015/03*, 11 September 2015.

About the authors

Étienne Espagne is Economist at CEPII. He teaches energy and environmental economics at ENSTA ParisTech. A civil engineer from Mines ParisTech, he holds a PhD in economics (EHESS, CIRED), and has previously worked at France Stratégie and ADEME.

Corresponding Author: etienne.espagne@cepii.fr

Previous Issues

Transatlantic Trade: Whither Partnership, Which Economic Consequences? by Lionel Fontagné, Julien Gourdon & Sébastien Jean, No 1, September 2013.

Can the Euro Area Avoid a “Lost Decade”? by Benjamin Carton, Jérôme Héricourt & Fabien Tripier, No 2, April 2014.

China’s Roadmap to Harmonious Society – Third Plenum Decisions on “major issues concerning comprehensively deepening reforms” by Michel Aglietta & Guo Bai, No 3, May 2014.

A New Architecture for Public Investment in Europe: The Eurosystem of Investment Banks and the Fede Fund by Natacha Valla, Thomas Brand & Sébastien Doisy, No 4, July 2014.

Central Bank Currency Swaps and the International Monetary System? by Christophe Destais, No 5, September 2014.

Financing Energy and Low-carbon Investment: Public Guarantees and the ECB by Michel Aglietta & Étienne Espagne, No 6, March 2015.

A Holistic Approach to ECB Asset Purchases, the Investment Plan and CMU by Natacha Valla, Jesper Berg, Laurent Clerc, Olivier Garnier & Erik Nielsen, No 7, April 2015.

Currency Turmoil in an Unbalanced World Economy by Michel Aglietta & Virginie Coudert, No 8, July 2015.



CEPII (Centre d’Etudes Prospectives et d’Informations Internationales) is a French institute dedicated to producing independent, policy-oriented economic research helpful to understand the international economic environment and challenges in the areas of trade policy, competitiveness, macroeconomics, international finance and growth.

CEPII Policy Brief
CEPII’s insights on international economic policy
CEPII – Paris – 2016
All rights reserved. Opinions expressed in this publication are those of the author(s) alone.
Editorial Director: Sébastien Jean
Managing Editor: Natacha Valla
Production: Laure Boivin

CEPII
113, rue de Grenelle
75007 Paris

+33 1 53 68 55 00

www.cepii.fr

Press contact: presse@cepii.fr
