MOBILIZING CLIMATE FINANCE

A ROADMAP TO FINANCE A LOW-CARBON ECONOMY

REPORT OF THE CANFIN-GRANDJEAN COMMISSION
JUNE 2015

Acting on climate is not a choice between the economy and environment. All we need is political will, but political will is a renewable resource.

Al Gore, September 23rd, 2014

This report presents the conclusions of the Canfin-Grandjean Commission and proposes to the President of the French Republic paths of action to mobilize increased public and private funding in the fight against climate change. It also forwards proposals on how the French government could advance the 'innovative climate finance agenda' in the various international forums in which it participates (G7, G20, IMF, OECD, etc.). The present report covers the financial instruments identified more than a decade ago as 'innovative' (financial transaction tax, carbon market auctions revenues, etc.). It, however, goes further to also look at the means of finding 'innovative' ways of using existing tools in the 'toolboxes' of both private and public actors to scale-up financial flows for the low-carbon economy.

PRESENTATION OF THE CANFIN-GRANDJEAN COMMISSION

PRESIDENT OF THE FRENCH REPUBLIC

Paris, 25 February 2015

Dear Minister,
Dear Sir,
Dear Pascal, [handwritten]

In late 2015, France will be hosting the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change. One of the key points of these major negotiations will be compliance with the commitments made in Copenhagen in 2009 as regards funding for the countries of the South ($100 billion per year of public and private funding from 2020). Restoring confidence in this area is, as believe the vast majority of observers and stakeholders, an absolutely necessary condition for the Paris Conference to be successful. That is why France will be mobilizing the national leaders and decision-makers concerned around the theme of financing.

In a difficult budgetary context for many countries, which makes increasing tax pressure very difficult, it will be necessary to develop the use of innovative financing mechanisms to meet those commitments.

To address that goal, I am entrusting you with co-chairing an independent commission, which will be responsible for advising the government on how to advance the innovative financing agenda in the various international forums in which it participates. To do so, the commission will review the stage of development and the potential of the various innovative financing mechanisms proposed to date aimed at facilitating the funding of climate change mitigation and adaptation in the countries of the South. It will be useful for the commission to make contact with the German Federal Ministry of the Environment, which commissioned a review of innovative climate financing mechanisms from the think tank CICERO in the framework of the German G7 Presidency, in order to draw on that analytical work, the initial results of which should be available in late March.

The commission will be made up of economists, experts, financial stakeholders and representatives of companies concerned by climate change. Representatives of the Ministry of Finance and Public Accounts, the Ministry of Foreign Affairs and International Development, and the Ministry of Ecology, Sustainable Development and Energy, will also be involved in its work.

The commission may hear anyone whose opinion and expertise are needed. It will present its conclusions to decision-makers in the form of a report, in late May 2015.

It will decide its working schedule and provisional agenda during its inaugural meeting. Its conclusions will be made public.

As chair, please keep me updated regularly of the progress of the commission's work.

Yours sincerely,

Best regards, [handwritten]
[Signature]
François Hollande

Mr Pascal Canfin
Former Minister

Mr Alain Grandjean
Economist

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We equally thank our interlocutors within the French government as well as the Presidency of the Republic for their availability and involvement.

1. Please note: the views expressed in this report are those of the co-presidents and reporters. They do not reflect the opinions or positions of the persons interviewed, nor their respective institutions.

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1. EXECUTIVE SUMMARY

1. EXECUTIVE SUMMARY

This report presents the conclusions of the Canfin-Grandjean Commission and proposes to the President of the French Republic paths of action to mobilize increased public and private funding in the fight against climate change. It also forwards proposals on how the French government could advance the 'innovative climate finance agenda' in the various international forums in which it participates (G7, G20, International Monetary Fund, Organization for Economic Cooperation and Development, etc.). The present report covers the financial instruments identified more than a decade ago as 'innovative' (financial transaction tax, carbon market auctions revenues, etc.). It, however, goes further to also look at the means of finding 'innovative' ways of using existing tools in the 'toolboxes' of both private and public actors to scale-up financial flows for the low-carbon economy.

This report is linked to two concurrent processes.

Firstly, this report is part of the larger run-up to CoP21 to be held in Paris between the 30th of November and the 11th of December, 2015. The core of the proposals forwarded in this report falls outside stricto sensu of the scope covered by negotiations within the framework United Nations Framework Convention on Climate Change (UNFCCC). Nevertheless, they serve to support the 'Compact ' or the 'Alliance' for climate that will be reached in Paris: this will include the formal UNFCCC agreement, as well as commitments made by public and private actors outside of the agreement itself. The proposals presented in this report can therefore contribute to the success of the financial dimension of the 'Paris Climat Compact' that, in our eyes, consists of three dimensions:

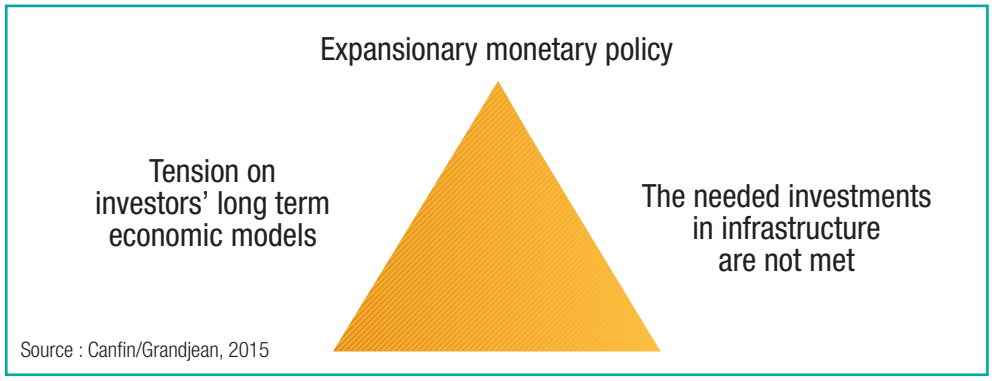
– Demonstrate how to honor the commitment made by developed countries at Copenhagen in 2009 of *"mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries";*

– Assist the most vulnerable countries to adapt to the consequences of climate change through dedicated commitments; and

– Make CoP21 a political milestone that communicates to economic decision makers and investors the coming acceleration in evolution of the 'rules of the game' to ensure that public and private investments are compatible with keeping the increase in global average temperature below 2°C.

Secondly, this report recognizes the current global economic context marked by the three elements include in the 'Triangle of Paradoxes':

Figure 1 The triangle of paradoxes

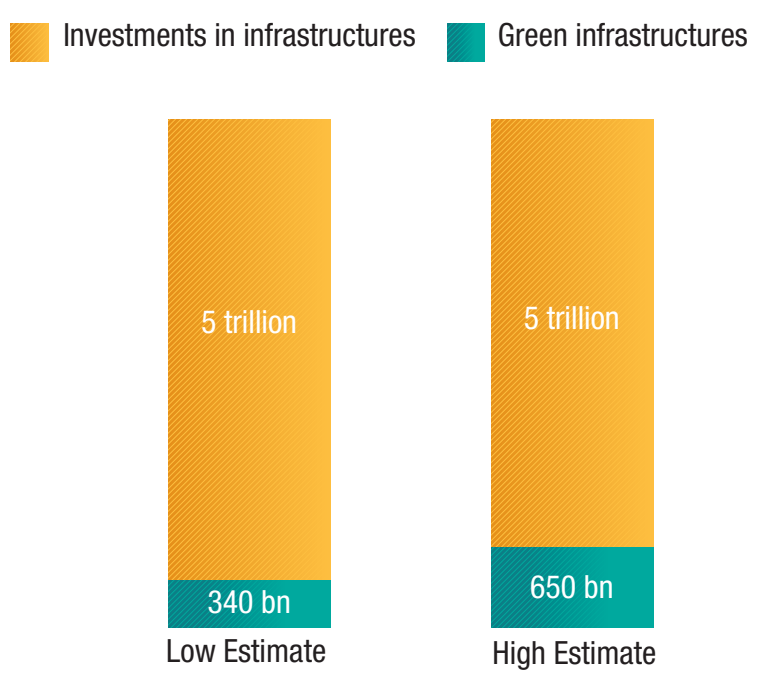


Source : Canfin/Grandjean, 2015

The monetary policies implemented to date by central banks have not led to a return to historic investment levels. Investment levels remain below those in 2008, This is the case despite the dramatic decline in interest rates in high-income countries. This in turn, has led to a strong demand from institutional investors for infrastructure investment opportunities - allowing a diversification of their financial portfolios given the current low returns on government bonds.

The transition to a low-carbon economy is a necessity in the light of climate change, but also a way of overcoming the current global macroeconomic and macro-financial difficulties. This will lead to an increase in low-carbon infrastructure. At present, only 7 to 13% of total global investments in infrastructure can be defined as 'green'[1].

Figure 2 The share of green infrastructure investments is estimated in the range of 7 to 13% in 2013



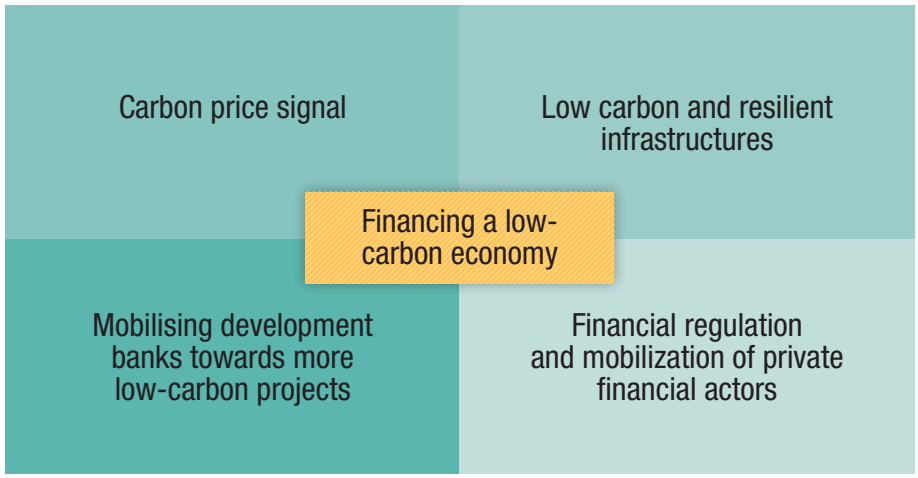
Source : Canfin/Grandjean, 2015, using data from United Nations Framework Convention on Climate Change, 2014 and New Climate Economy, 2014

This portion of total investment is clearly insufficient and is due to many factors analyzed in this report. In order to achieve a rapid increase in the share of 'green' investment requisite for the climate change challenge, we propose a 'low-carbon financial roadmap' coherent with the objective of limiting global warming to less than 2°C.

1. Calculated by Canfin / Grandjean after UNFCCC data

The individual proposals that make up this roadmap are detailed in the Section 3.1 of the report and can be grouped around the following four dimensions:

Figure 3 The four dimensions of a low-carbon financial roadmap



Source : Canfin/Grandjean, 2015

1. The carbon price signal

The first challenge is to phase out fossil fuel subsidies that act in many ways as a negative carbon price. According to researchers from the International Monetary Fund (IMF), they represent an economic cost of around $ 10 million dollars per minute! This is well above current subsidies for re-newable energy. The recent oil price decline is a historic opportunity to reduce these subsidies.

Furthermore, given the intense international discussion prior to the CoP21, we propose that devel-oped and emerging countries agree on a voluntarily basis – and outside of the scope of the UNFCCC international agreement – to a 'carbon corridor' or a 'carbon target' with a minimum target price of 15 to 20 dollars/ton of CO2 in 2020, and a maximum target price of 60 to 80 dollars/ton of CO2 in 2030/2035.

This 'carbon corridor' would allow Governments at CoP21 to transmit the necessary common political message, as well as the needed flexibility in price levels to gather countries with different levels of development.

2. Financial regulation and the mobilization of private financial actors

This report recognizes the numerous initiatives taken since the UN Climate Summit in New York in September 2014. It also reflects the unprecedented awareness in the financial world that has led to the integration of the climate challenge. This integration has evolved from being seen as part of 'extra-financial' or 'social and environmental responsibility,' to a potential major financial risk threatening the business models of companies, and financial stability in general. Actions in this area are accelerating as demonstrated by the following examples:

– the mandate given in April 2015 by the G20 to the Financial Stability Board (FSB);

– the vote in France in May on legislation mandating asset managers to communicate information on both their exposure to climate risks, particularly in terms of carbon footprint of their portfolios, and their contribution to limiting global warming; and

– the work of the People's Bank of China on 'greening the Chinese financial system' as part of the preparation of the next five-year plan.

3. Development banks [1]

This report lists proposals for financial innovation that will enable development banks to finance more low-carbon projects and increase their leveraging of private finance for these projects (development of guarantees, new role of development banks in relation to capital markets, strengthened capacity to support the emergence of low-carbon projects, management of political and convertibility risks, etc.). Given that each development bank is different, we propose that France requests each development bank develop its own '2°C financial roadmap' by CoP21. This document should explain how each institution sees its role in financing the low-carbon economy; the commitments it can make to support this transition; any constraints it faces including, if necessary, such as capital limitations, etc.

4. Low-carbon, climate-resilient infrastructure

Infrastructures is an essential part of the investments needs: sustainable urban infrastructure; production infrastructures and transmission networks for electricity; information technology (IT) networks enabling the convergence of the green economy and the digital economy, etc. Therefore, the goal is to remedy the current delay that the global economy has accumulated in financing infrastructures; and the reallocation of this funding from carbon intensive models to 'low carbon.' This reallocation has a relatively small additional cost, as demonstrated by the New Climate Economy report released in 2014.[2] Nevertheless, some of the intrinsic characteristics of 'low-carbon' infrastructure may lead to blockages or increase the cost of capital. This can include the absence of historic data to evaluate the future cash flow, weak expertise of administrations to integrate low-carbon specifications into public procurement and tenders, untested or unfamiliar economic models, etc.. Identifying and overcoming these obstacles, particularly in developing countries, is a key dimension of the low-carbon financial roadmap. That is why we propose that some of the international community's development objectives should be formulated as goals, such as a decrease in the cost of capital for renewable energy in developing countries.

The combination of these four dimensions can give coherence and effectiveness to the financing of a low-carbon economy. The resulting integrated roadmap should be monitored by the international community, which is not yet the case today.

In order to ensure continuity in the monitoring of the roadmap to finance a low-carbon economy, we propose that before the CoP21 the IMF and the World Bank should be mandated to monitor the implementation of this roadmap, in coordination with institutions deemed relevant to perform this task, particularly those under the United Nations Framework Convention on Climate Change (UNFCCC).

1. This report uses the generic 'Development Bank' term to refer to: Multilateral Development Banks, Multilateral Financial Institutions, Multilateral Development Institutions, Regional Banks, Banks and national development agencies.

2. NCE (2014) Better Growth, Better Climate, Global Commission on the New Climate Economy.

10 KEY RECOMMENDATIONS FOR THE ROADMAP TO FINANCE A LOW-CARBON ECONOMY

1 Establish a monitoring process for the low-carbon financial roadmap to ensure its longevity beyond CoP21. The IMF and the World Bank could be charged with the supervision and implementation of this roadmap, in coordination with the institutions deemed relevant to perform this task, particularly within UNFCCC. The objective will be to monitor, in particular, the development of the carbon price signal (including phasing out fossil fuel subsidies), the reforms allowing the removal of barriers to investment in low-carbon infrastructure, the '2°C roadmaps' of development banks, the integration of climate risk in financial regulation, the relative volume of 'green' investments compared with total global investments in infrastructure and the evolution in the decoupling of GDP and greenhouse gas emissions. ■

2 Establish a carbon price signal. A voluntary commitment from developed and emerging countries to put an explicit carbon price signal into effect, between a minimum target price of 15 to 20 dollars/ton of CO2 in 2020, and a maximum target price of 60 to 80 dollars/ton of CO2 in 2030/2035, according to levels of development. ■

3 Integrate climate in macro-economic models. The integration of a 2°C scenario throughout the macroeconomic forecasts and models of international institutions (IMF, OECD, etc.) and finance ministries in order to ensure a better coherence between short-term analysis and forecasts, and long-term low-carbon objectives. Any model or forecast, for example energy market forecasts, that is incompatible with the 2°C limit should be explicitly identified as such. ■

4 Development of national strategies to finance the decarbonization of the economies. Governments, beginning with developed countries, should produce national decarbonization strategies for their economies, covering the needed financing, both public and private. France has adopted the principal of such a strategy in its law on the energy transition for green growth; the G7 countries also committed to this principal in June 2015[1]. Among the key indicators for such strategies could be the relative volume of 'green' investments compared with total global investments made each year, combined with annual targets. France could propose to that IMF and the World Bank monitor this indicator, country by country, and to aggregate investment levels at the global level. ■

5 Request that each development bank develop a '2°C investment roadmap' compatible with the 2°C limit. This roadmap should specify how the development banks intends to contribute to the fulfillment of the 2°C limit agreed to by the international community. A joint monitoring process by multilateral, regional and bilateral development banks could be established, with a public report presented every two years during General Meetings of the IMF and the World Bank. ■

1. « To this end we also commit to develop long term national low-carbon strategies », G7, Déclaration de juin 2015

6 Increase the use by development banks of instruments and tools with high leverage ratios, such as guarantees, subordinated debt or credit enhancement, to increase climate finance at comparatively low costs. France could request development banks to estimate their capacity to mobilize additional climate finance through an increased use of these tools.
In the particular case of France, the Agence Française de Développement (AFD) is today the only international development finance institution subject to Basel 3 prudential regulation. According to our estimations, if aligned with the prudential frameworks used by other development banks, the AFD could increase its activity by € 1 to 2 billion. ■

7 Include in the 2016 G20 work program the forthcoming recommendations of the Financial Stability Board (FSB), which was mandated in April 2015 by G20 finance ministries to analyze the potential impacts of climate change on financial stability. ■

8 Request that the Bank for International Settlements (Basel Committee) define methods to include climate risks in stress tests for banks and insurance companies. This should include methodologies to assess the performance of assets held by banks and insurance companies in the +4°C scenario as developed by the International Panel of experts on Climate Change (IPCC). France, in partnership with other countries, could formally request the Basel Committee on this issue. ■

9 Establish a public monitoring system for financial actors' engagements that have multiplied in recent months, including: the integration of climate risk; measuring greenhouse gas emissions induced by their financial activities; and increasing financing for the green economy. The UNFCCC's Nazca Platform, which centralizes these commitments, can be used and further developed by CoP21 in order to increase the visibility of progress in this area within the broader 'Agenda of Solutions.' These commitments could be comprised in an annual public report.
In the particular case of France, the recently voted provisions of the energy transition for green growth legislation require institutional investors to measure the greenhouse gas emissions linked to their financial activities and to explain how they address the 2°C scenario. These same provisions could be usefully extended to private banks concerning their lending activities. ■

10 Adopt the methodology developed by the OECD in June 2015 to analyze the alignment of public policies with low-carbon development. This is a key means of assessing the integration of progressive decarbonization targets in all public policies. We propose that France be part of the first countries to commit to apply this framework internally and urge other member countries of the OECD and OECD key partners[1] to do so before the CoP21.
In the particular case of the European Union (EU), the financing of the Juncker Plan totaling € 315 billion could be made conditional on climate co-benefits criteria and projects related to the implementation of the low-carbon transition could be prioritized (energy efficiency and technology projects). France could communicate broadly on its recent legislative developments to integrate climate issues into financial regulation. The French government could propose to its European partners to move forward in this direction. *France could therefore request that the European Commission addresses this issue and proposes a plan of action for the next 2 to 3 years to be delivered ahead of CoP21.* ■

1. OECD Key partners are Brazil, China, India, Indonesia and South Africa.

Why does this matter for developing countries?

Developing countries remain largely outside of existing international private capital flows. The reallocation of these flows is therefore principally an issue for developed and emerging countries. Nevertheless, the proposed agenda to reorient private capital flows holds significant benefits for developing countries.

1. Firstly, mitigation action and the achievement – or not –of the 2°C limit by developed and emerging countries will have direct consequences on the most vulnerable countries. The sooner investment flows are 'greened,' the less severe the impacts from climate change will be.

2. An increasing number of African countries are seeing the development of domestic capital markets (Nigeria, Kenya, Ethiopia…). These countries will benefit from the work realised to integrate climate issues into market regulation, both in terms of information systems and risk management.

3. The additional mobilization of risk hedging tools by development banks will allow private investors to invest more easily in countries that they do not consider today as part of their investment universe.

4. Developing and emerging countries host many of the central banks that are the most active in channelling domestic financial flows towards green projects. Bangladesh is a striking example, as well as Brazil, China, Indonesia.[1] This is thus not only an issue on the 'Northern political agenda,' but on the contrary, a common concern that has already found concrete translation in the global South; at least as much as in the North. This increases the potential of international cooperation on the matter.

In parallel to the integrated global roadmap for the financing a low-carbon economy, this report looks at a number of the 'innovative' financing instruments that could allow the mobilization of additional, and particularly public, climate finance.

Among the existing 'menu of options for innovative financing,'[2] this report has analyzed in detail: the potential financial resources from the financial transaction tax (FTT) under voluntary negotiation between 11 European Member States; the potential revenues from carbon offsetting in international transport; and carbon market auction revenues.

France has repeatedly announced its willingness to earmark a significant portion of the revenues of a FTT for climate at the international level. The ongoing negotiations on such a tax among 11 Member States of the European Union is a key element in assisting, notably France, the mobilization of additional public funding for climate in order to fulfill the '$ 100 billion of Copenhagen' commitment. To this end, this report concludes that at least € 10 billion in revenues from the TTF will be needed in 2020 among the 11 Member States. Negotiations must conclude no later than September in order to optimize its potential contribution to the success of the CoP21.

In terms of international transports, this report has particularly analyzed the case of international aviation. In 2010, the aviation sector committed to an aspirational goal of carbon-neutral growth from 2020; the specific means of achieving this objective to be announced in 2016. In addition to energy efficiency standards for airplanes and engines,

1. UNEP Inquiry (2015a) The coming financial climate, UNEP Inquiry into the Design of a Sustainable Financial System.

2. The 'menu of options' refers to the work of the Leading Group on Innovative Financing for Development

whose application must be accelerated and widespread, the implementation of this commitment increasingly appears to include the creation of carbon offsetting. If focused on developing countries, and in particular the most vulnerable countries, this could generate between $ 2 and 6 billion in financial climate flows in 2025. This is increasingly recognized as the most economical way for the sector to fulfill its engagement. Furthermore, it could also finance at scale the restoration of degraded agricultural lands.

Moreover, developed countries' capacity to mobilize revenues earned from carbon markets depends on the sovereign political decision to allocate part of these revenues to international actions. If, for example, 25% of revenues generated by the Emissions Trading Scheme (ETS) of the European Union were allocated for climate in developing countries – compared to 14% today - this could represent between € 3.5 to 5 billion a year on average, over the period 2015-2030, depending on to carbon price assumptions.

Finally, mobilizing more climate finance involves several key elements: more public funds; the improved leveraging of public funds and the increased use of public guarantees to the mobilize private funds; and the scaling-up of private investment flows towards a low-carbon economy. Most of the mobilization of public and private flows has – and will– come from domestic sources. The role of North / South flows and development banks is nevertheless critical, particularly in the least developed countries.

Thus at both the national and international level, the role of government is twofold: to provide financing or guarantees, and to establish the rules of the game that incentivize the redirection of private investments towards a low-carbon economy.

2. CONTEXT

2. CONTEXT

2.1 THE TRANSITION TO A LOW-CARBON ECONOMY

2.1.1 The beginning of a decoupling between GDP and CO2 emissions

In 2009, Governments committed to keeping global average temperature increase below 2° Celsius above its pre-industrial level. This figure is the result of a political decision based on scientific expertise. Recent studies[1] and statements made in Bonn early June 2015 demonstrate that high risks are anticipated even with a global warming of +1.5°C.

However, according to the most recent report from the IPCC, if greenhouse gas (GHG) emissions continue to increase at the current pace, by the end of the century the average temperature would increase by between 3.7°C and 4.8 °C.[2] The consequences would be disastrous. As an example, 1.4 billion people could experience severe water shortages in Africa, the Middle East and South-East Asia. In a +4°C world, efforts to combat extreme poverty and hunger would be lost before they could even begin and would result in hundreds of millions of people being pushed back into poverty in developing countries[3].

Pursuing this objective together with the aims of economic development requires that Gross Domestic Product (GDP) growth be massively decoupled from GHG emissions. Principally, this implies that a significant portion of fossil fuel reserves remains in the ground.[4] Considering only fossil fuels, the carbon intensity of the world's GDP was 1,000 gr CO2 per $ Purchasing Power Parity (PPP)[5] of GDP in the 1960's: it was around 500 gr CO2 at the beginning of the 21st Century. In 2010, it was 400 gr CO2 per $ PPP. With an objective of 2% yearly world GDP growth in volume until 2050, the carbon intensity per $PPP should not exceed 60grCO2 in 2050, or be divided by 6 (see Figure 4 and Figure 5). With a 3% growth rate, it should be divided by 10.

It appears that signs of this decoupling can already be observed: GHG emissions from energy were stable in 2014, while GDP has increased by 3%.

Since 1960, CO2 emissions have increased less rapidly than global GDP.

1. Resulting from an ongoing dialogue between COP negotiators and several dozen scientists, in particular from the Intergovernmental Panel of experts on Climate Change (IPPC), since 2013. These studies were presented in a technical report to the UNFCCC in May 2015.

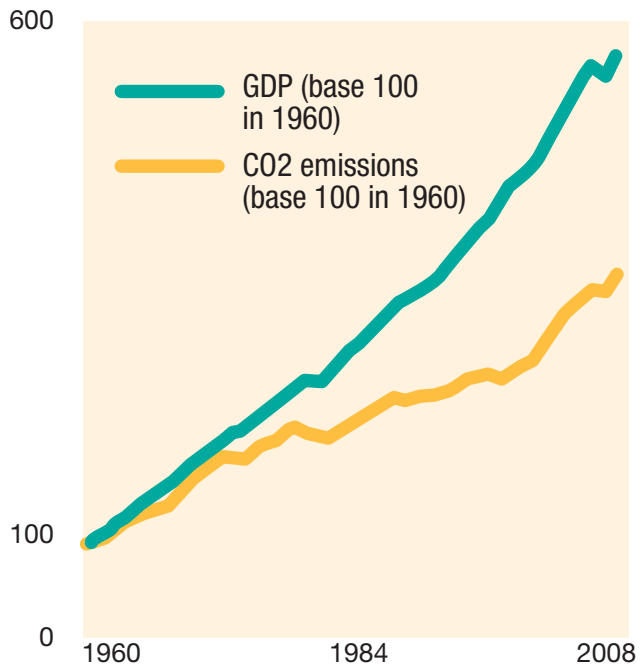
2. IPCC (2014) 5th Assessment Report, International Panel on Climate Change.

3. World Bank, (2014), Turn Down the Heat. and NCE 2015 Catalyzing International Cooperation for Growth and Climate Action, Global Commission on the New Climate Economy.

4. A January 2015 Nature publication documents that only a quarter of the proven and usable fossil fuel reserves could be burn. Christophe McGlade & Paul Ekins (2015) "The geographical distribution of fossil fuels unused when limiting global warming to 2 °C," Nature, 517: 187–190, January 2015.

5. GDP at Purchasing Power Parity allows comparing international GDP expressed in purchasing power of national currencies, without taking into account price differences existing countries.

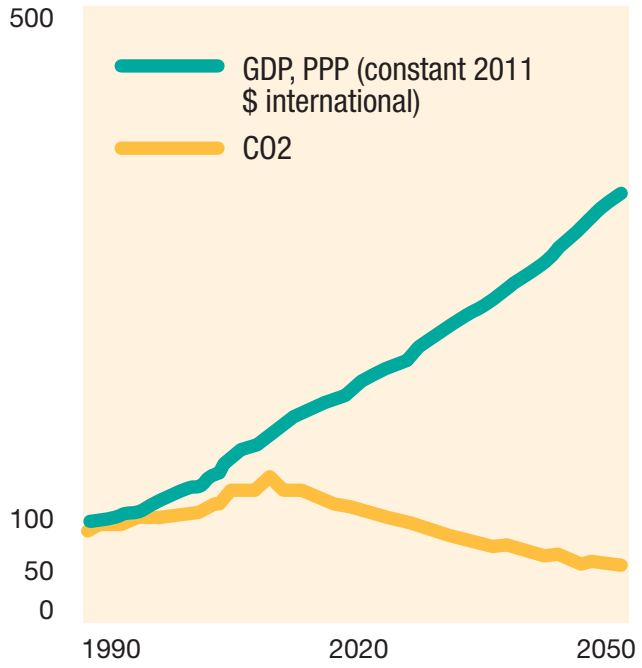
Figure 4 Growth of global GDP and CO2 emissions from 1960 to 2010



Source : Carbone4

But this decoupling and the emissions reduction need a change in magnitude for the temperature increase to be kept below 2°C at the end of the century.

Figure 5 Projected growth until 2050 of global GDP and CO2 emissions in a 2°C scenario



Source : Carbone 4, hypothesis of GDP growth assumption of 2% per year from 2010 to 2050

Clearly, such a decoupling cannot be reached through 'moderation' alone (i.e. consuming less with the same organization and level of capital). This could decrease GHG emissions by only a few percentage points. The transition to a low-carbon economy requires profound shifts in the current socio-economic models, both in developed and developing countries. This massive evolution is within reach today.

A significant amount of investors – including institutional investors – are looking for long-term investment opportunities, such as infrastructure projects (see Section 2.3).

Compatible technologies are developing very rapidly and have often demonstrated sufficient economic performance to merit a change in scale. This is due in particular to the huge decrease in costs over the past years. In terms of renewable energy, a record-breaking capacity of 103GW was installed worldwide in 2014 for an investment cost of $ 270 billion[1]. This occurred despite somewhat faltering sectoral policies in Europe and continued massive public support for fossil fuels (see Section 3.2). Since 2013, more than one in two watts of installed capacity on the planet comes from a renewable energy source. In terms of energy efficiency, solutions are also now available at a competitive cost. For instance, the French automobile fleet burned 20% less energy in 2012 than in 1992; and the average energy consumption per square-meter of housing has also decreased by 20% over the same period. Even in the agricultural sector, the development of 'agroecology'[2] means that productive, resilient and resource-efficient practices are now within reach.

Several reports, including that of the Global Commission on the New Climate Economy published in 2014, demonstrate that the incremental cost between an investment scenario sufficient to satisfy development objectives of developing and emerging countries; and a scenario that fulfils these objectives in a manner coherent with keeping global warming below 2°C could be modest. This does not even take into account the massive economic costs resulting from climate change. Hence, as was made clear by the Stern Report in 2006, the cost of inaction is much higher than the cost of action. The business and financial world is starting to take notice of this transformation, as will be established below (see Section 3.6.1).

Going one step further, the NCE demonstrates that combatting climate change is a prerequisite to future prosperity. Maintaining a 2% annual growth rate in the coming decades would not be feasible if the planet were subjected to the impacts of a runaway climate change. For example, a possible sharp decrease in crop yields due to climate change could lead to severe damage to the agricultural sector. Polluted cities congested by hundreds of miles of traffic jams have growing negative consequences for productivity, human health, economic output and quality of life. Therefore tackling climate change and investing for development are not competing objectives. On the contrary, investment in a low-carbon economy is conditional to ensuring future prosperity for all (see Figure 11).

1. UNEP (2015) Global Trends in Renewable Energy Investment, United Nations Environment Program. Half these investments are for solar photovoltaic installations, the cost of which has decreased drastically over the past few years.

2. Michel Griffon (2013) Qu'est-ce que l'agriculture écologiquement intensive ?, Quae Publishing House.

2.1.2 The milestones of a roadmap to finance a low-carbon economy

The main avenues for reducing the carbon footprint of our economies are investments in energy efficiency, low-carbon energy and transport, buildings and housing, agriculture and forestry as well as innovation, research, and development. More precisely, investment needs can be presented as follows.

- The decarbonization of all energy sources, starting with electricity, through massive investment in renewable energy and associated infrastructure. According to the World Bank for example, the target for average emission for 2050 should be 65gr CO2 per kwh, rather than the 680 gr CO2 per kwh observed in 2010[1].
- The increased electrification of sectors which currently use fossil fuels, which will require the overcoming of a number of technological and organizational barriers. According to the World Bank, a trajectory compatible with a "2°C roadmap" implies increasing the share of electricity in the world's energy mix from 29% to 45% between 2010 and 2050, and a simultaneous decrease of fossil energy from 68% to 48%.
- The emergence of compact and sustainable cities including buildings renovation in existing towns. The main issue in developed countries is the retrofitting of existing buildings; in developing countries, it is the adoption of climate-objective coherent building codes for new buildings.
- The decarbonisation of the transport sector[2]. This requires: the pursuit of energy efficiency improvements to vehicles and transport; raising the user capacity of vehicles; developing public transport; and moderating the broader demand for passenger and freight transport.
- Controlling the energy consumption of extraction, processing, and industry in general. This involves reducing the energy intensity of the processing of raw materials, both at the level of the production unit, and more broadly at the global level for industry and services.
- Projects enabling reforestation, to increase the size of natural carbon sinks. Priority actions are laid out in the "New York Declaration on Forests" (UN REDD program)[3].
- The restoration of the 500 million hectares of degraded land worldwide. This is part of the process of adapting to the impacts of climate change. It is key to food security, while developing the carbon sinks that are essential to winning the race against rising temperatures. An objective of 'land degradation neutrality' will likely be adopted within the Sustainable Development Goals to be adopted in September 2015. This will lead to an objective of restoration of 12 million hectares of degraded lands annually.
- Shifting to a "circular economy" model, thereby increasing resource efficiency. Beyond producing less waste and recycling more, the circular economy breaks the linear logic of extraction, processing, consumption and disposal. Adopting a circular economy is a necessary step towards carbon neutrality, which must be achieved by the end of the century.

1. World Bank (2015) Decarbonizing Development, World Bank Group.

2. Responsible for 14% of global CO2 emissions according to the IPCC Working Group III Report.

3. Commitment to restore 150 million hectares of cleared or degraded forest land prior to 2020 and increase the global restoration rate after, in order to restore at least 200 million additional hectares prior to 2030.

2.1.3 Investing more, and better, than today

The NCE Report estimates the required investment at $93 trillion between 2015 and 2030. This sum does not take into account the necessary investments to adapt to the impacts of climate change. It comes at a time when the need to renew infrastructures is great in developed countries, and when the needs for new and significant infrastructures are even greater in emerging and developing countries. In addition, the incremental cost related to the inclusion of climate change in the projects only reaches 5% of total project cost, according to NCE, and this without taking into account the economic losses due to the consequences of climate change.

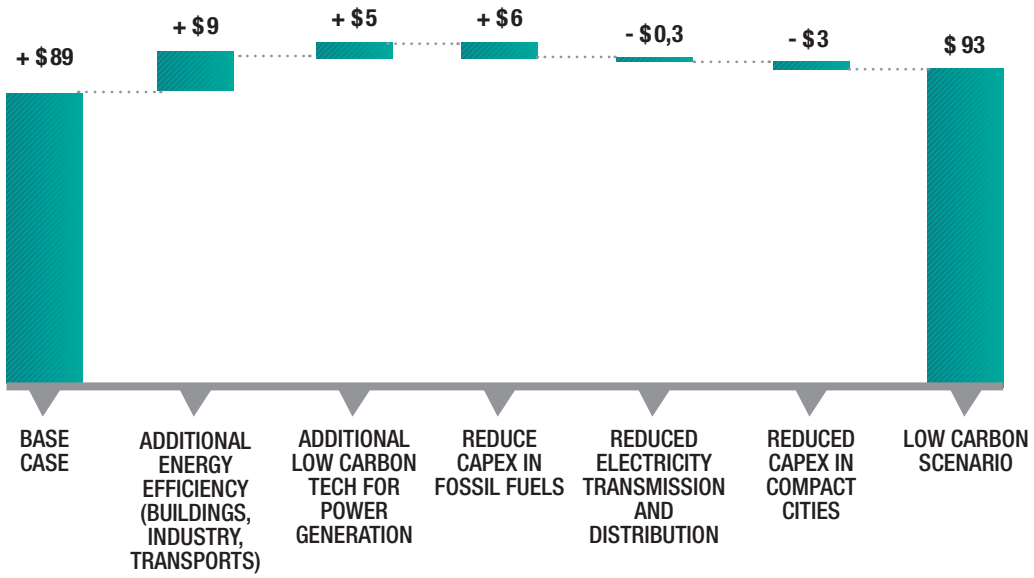
It is therefore clear that moving beyond the consequences of the 2008 financial crisis requires a return to a higher rate of investment than today, especially in infrastructures. These investments are a prerequisite to development and to the financing thereof, given that the quality and availability of a country's infrastructure are key parameters in an investor's decision-making process.

Therefore, the financing of a low-carbon roadmap requires both the increased availability of finance for infrastructure, and directing this finance towards low-carbon, resilient investments.

INFRASTRUCTURE INVESTMENT NEEDS FOR A LOW-CARBON ECONOMY: THE NEW CLIMATE ECONOMY'S SCENARIO

The numbers presented here are for indicative purposes only and are derived from the 5th International Panel of experts on Climate Change (IPCC) Assessment Report, and from:
– OECD for rail, railways, airports, ports, telecommunications and water/waste ;
– the International Energy Agency (IEA) for power generation, electricity networks, and energy end-use investment for building, industry and transport.
The Business As Ususal (BAU) scenario is based on the '6°C scenario' (6DS) from the IEA's Energy Technology Perspectives 2012, without taking into account the cost of climate change impacts; the low-carbon scenario is based on the '2°C scenario' (2DS). The low-carbon scenario is only marginally more costly than the BAU scenario ($ 93 trillion compared to $ 89 trillion). The additional low-carbon costs (additional energy efficiency and additional low-carbon technology for power generation) are partially offset by reduced investments in fossil fuels and in compact cities, that engender lower overall investment. The operational savings from reduced fuel expenditure are not taken into account in this scenario and would further reduce the cost of the transition to a low-carbon economy.
The BAU scenario predicts a doubling of air passenger traffic, a tripling of airfreight and a quadrupling of maritime containers traffic worldwide by 2030. The 2°C scenario sees the share of renewables reaching 57% of the worlds' electricity mix by 2050 (compared to 19% in 2009 and 24% in 2050 in the 6°C scenario). Total primary energy supply in the 6°C scenario is projected to increase by 85% in 2050 as a result of increased energy demand. Due to improved energy efficiency, this increase is limited to 35% in the 2°C scenario. The resulting demand for oil, natural gas and coal compared to a baseline scenario, based on Climate Policy Initiative's modelling, is estimated to be roughly 12%, 9% and 14% lower respectively in the low-carbon scenario by 2030.
IT infrastructure is at the convergence of information technology and the green economy – including smart grids, energy savings or transportation optimization software, and is taken into account in the above numbers. The shift to a low-carbon economy involves the development and deployment of these types of services, which may increase the lifetime of durable goods (cars, electrical appliances), as well as developing a functional economy that transfers the value added from the production of goods to the provision of a service. ■

Figure 6 Global investment requirements, 2015 to 2030, in $ trillion, constant 2010 dollars



Indicative figures only / High rates of uncertainty

INCLUDING OPERATING EXPENDITURES WOULD MAKE A LOW CARBON TRANSITION EVEN MORE FAVOURABLE LEADING TO A FURTHER REDUCTION OF US 5$TRILLION , FOR OVERALL POTENTIAL SAVINGS OF US 1$TRILLION

Source : NCE, November 2014, Technical Note on Infrastructure Investment Needs of a low-carbon scenario

Figure 7 Global infrastructure needs, 2015-2030 - $ trillion in 2010

BASE CASE SCENARIO

CATEGORY	$	OBJECT
Waste and water	**21,34**	Urban water services and to a lesser extent rural water services
Energy – Transports engines Energy use	**14,06**	Power trains for fossil-fuel light-duty vehicles, as well as full vehicle costs of planes, ships and rails
Transport Rails, ports, airports	**7,47**	New construction as well as maintenance for rail, infrastructure requirements for airports and ports
Transport Road	**6,2**	Investment for new construction and maintenance
Energy – Oil and gas	**11,55**	Oil 7,14, Gas 4,41 Oil includes upstream, refining and transport investment Gas includes upstream, transmission and distribution, and LNG investment
Energy – Power generation	**5,78**	Fossil-fuel power plants (oil, gas, coal-fuelled), renewables, nuclear, CCS and biofuels
Energy – Electricity T&D	**4,32**	Electricity T&D
Energie – Coal	**0,97**	Investment in coal mining
Energy – Buildings Energy use	**5,83**	Investments related to energy use in buildings eg ventilation and air conidtioning
Energy – Industry energy use	**3,95**	Investment related to energy use in the top five most energy intensive sectors: Chemicals and petrochemicals, iron and steel, pulp and paper, cement and aluminium
Telecoms	**7,14**	Fixed line telephony and data, mobile telephony and data including alternative wireless technologies beyond cellular mobile, and broadband mobile communications, especially wireless broadband
TOTAL	**88,61**	

ADDITIONAL COST OF THE LOW CARBON SCENARIO

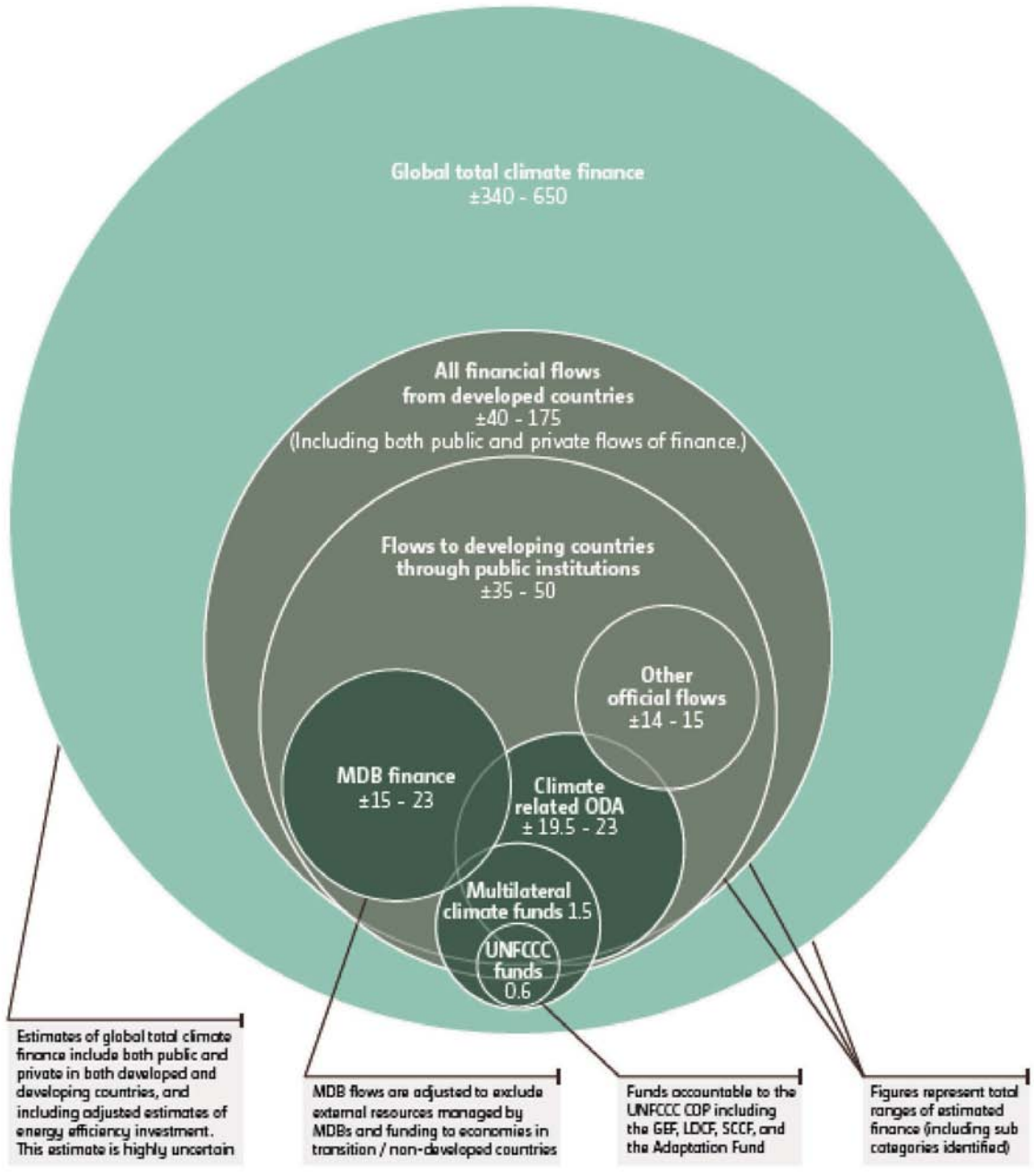
CATEGORY	$	OBJECT
Reduced capex from fossil fuels	**-5,7**	Reduced infrastructure spend on fossil fuel power plants and on the supply chain
Low carbon technology	**4,7**	Renewables including biofuels CCS and nuclear incremental deployment investment
Reduced electricity T&D costs	**-0,3**	Energy efficiency savings outweigh increased demand from renewables
Infrastructure for energy efficiency	**8,8**	Buildings, industry, transport engines. Incremental investment needed to improve energy efficiency
Reduced capex from compact cities	**-3,4**	Buildings, road, telecom water and waste, savings from a compact urban model
TOTAL	**4,1**	

Source : NCE, November 2014, Technical Note, Infrastructure Investment Needs of a low-carbon scenario.

1. UNFCCC SCF (2014) Biennial Assessment and Overview of Climate Finance Flows, United Nations Framework Convention on Climate Change Standing Committee on Finance.

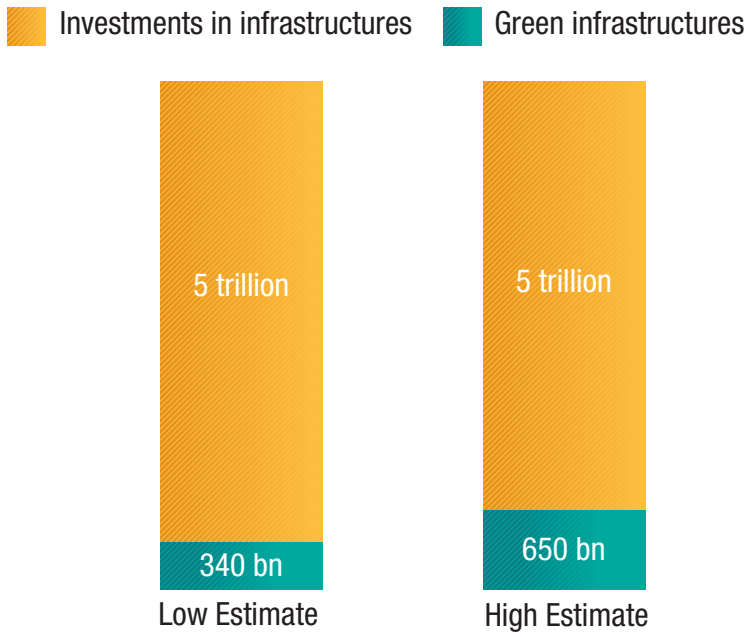
In 2014, the Standing Committee on Finance (SCF) of the UNFCCC estimated the current volume of climate finance worldwide to be in the range of 340 to 650 billion dollars. Within this amount, the flows from North to South countries are estimated in the range of 40 to 175 billion dollars of which public flows total between $35 to 50 billion.[1]

Figure 8 Climate finance are estimated between $ 340 and $ 650 billion in 2014



Source : UNFCCC Standing Committee on Finance, 2014

Figure 9 The share of green infrastructure investments is estimated in the range of 7 to 13% in 2013 [1]



Source : Canfin/Grandjean; UNFCCC Standing Committee on Finance, 2014

The absence of indicator aiming to measure the green share of infrastructure investments reveals the lack of markers providing a signal towards the financing of a low-carbon economy. For this reason, we propose that this indicator be part of the roadmap developed in this report (Section 3.1).

1. Total investments in green infrastructures ($350-$650 billion) comes from the SCF report: amount are derived from estimates by the NCE 2014 ($ 93 trillion from 2015 to 2030, or an order of magnitude of $5 trillion dollars per year).

THE IMPORTANT ROLE OF LOCAL AUTHORITIES

Sub-national and local authorities are worldwide on the frontline to feel the consequences of climate change. In California, Sao Paulo, or even the Indian States stricken with heat waves, local politicians are the first to deal with the short and long-term ramifications. Furthermore, they also hold key means of acting decisively, given that a significant share of the required investment to stay below 2°C is within their hands. While dependent on national legal frameworks, local authorities often have at least partial control of urban and transport planning, waste and water management, and in some cases public power utilities. They can also play a role in public procurement, notably through joint approaches to accelerate inclusion of low-carbon technologies and therefore offer large-scale opportunities for deployment for low-carbon products and materials.

This aspect of the scaling up of climate finance is not considered in detail in the present report but deserves further consideration and a more detailed assessment, particularly around the following issues:

– How to ease access to capital markets for large metropolitan areas in developing countries?

– How to ease access for sub-national governments to international climate finance, particularly from the Green Climate Fund?

– How to better support and coordinate the emergence of “compact and sustainable cities” through investments and urban planning, in particular through the efforts of development bank and agencies? ■

2.2 ADAPTATION FINANCING NEEDS FOR THE MOST VULNERABLE COUNTRIES

2.2.1 Funding for adaptation: what does this imply?

Funding for adaptation to climate change is a global stake, but first and foremost, it is a priority for the poorest and most vulnerable countries. Yet, at present, funding dedicated to adaptation is not readily tracked. This is due principally to a lack of clear definitions. Thus, it is important to distinguish between two main categories:

– firstly, funding for adaptation projects responding to the impacts of climate change, including for example, the construction of dykes to cope with sea-level rise;

– secondly, the preventive integration of future climate impacts in development projects (construction of resilient infrastructure, methods of agricultural production, management of water resources, etc.).

These two categories imply different financial rationales.

In the first case, the goal is to build an infrastructure that responds to the existing and future impacts of climate change. There is no purely private business model for financing these projects, which generally falls in the category of public goods. Indeed, the dyke, to continue with this example, is funded either by the local or international taxpayers.

In the second case, the goal is to adjust a project that would have occurred in any case, given development needs and objectives. Adaptation funding is defined here as the incremental cost linked to project designs that improve resilience and overall resistance to the impacts of climate change, and not as the entire cost of the project. The evaluation of this incremental cost varies for each project and is difficult to express as an overall average.

Nevertheless, the infrastructure investors interviewed for this report clearly argue that the earlier the resilience component is integrated into a project, the more efficient and less costly it is. It is therefore important for different stakeholders involved in development to commit to the systematic and upstream integration of adaptation to climate change. At the Summit for Peace and Security in Africa in December 2013, the French government declared that *"France will ensure that all infrastructure financed projects in Africa will be resilient to the impacts of climate change starting from 2015."* In the same spirit, President Obama declared via an Executive Order released at the New York Climate Summit in September 2014 to integrate climate resilience in international programs and development investments financed by the United States. Unfortunately, these examples don't stand as the general rule and this process of integration is far from broadly implemented - although it is the most effective way to address the consequences of climate change, including financial impacts. In June 2015, the G7 countries pledged to *"incorporate climate mitigation and resilience considerations into their development assistance and investment decisions".* This will certainly accelerate this current dynamic.

In addition, the integration of adaptation may not always lead to an increased incremental cost, but represent a change in practice that could be instead be revenue-generating and cost-saving. For instance, given increased water scarcity,

1. « We pledge to incorporate climate mitigation and resilience considerations into our development assistance and investment decisions.», G7 Declaration, June 2015.

investments in water efficiency may well confirm their economic viability through reduced water consumption.

In this context, the ongoing work by development banks to develop a common methodological approach to account adaptation, to be published in July 2015, is expected to improve the understanding and transparency of these financial flows.

Despite these uncertainties, it is reasonable to estimate that the majority of financing for adaptation in the most vulnerable countries is public. The potential incremental cost linked to improving the resilience of a project is difficult to integrate into a profit-based business model, given that it rarely generates additional revenues. In the medium term, integrating resilience into infrastructures, even those financed by private sector, will progressively allow private economic models to better finance adaptation.

2.2.2 Financing for adaptation: state of play

Many reports provide estimates of the funding that is currently devoted to adaptation[1]. Examples include:

– The Climate Policy Initiative (CPI) estimates that $ 25 billion of public funding was devoted to adaptation in 2013, of which $ 8 billion came from Northern development finance institutions.

– According to various analyses by the OECD, adaptation funding represented between $ 6.8 to $ 9.6 billion in 2013, of North to South flows.

– According to the OECD, 45% of the funding for adaptation is devoted to low-income countries and to Least Developed Countries (LDCs)[2]. The LDCs are the most vulnerable countries given that that they are both highly exposed to the impacts of climate change and also dispose of few resources to improve resilience, including a lack of human and financial capital.

It is important to recall that these analyses focus on figures from 2013, and thus do not integrate the finance devoted to the Green Climate Fund (GCF). The GCF should devote more than $ 1 billion per year for adaptation, without counting leverage, as set by its Board of Directors in the broad guidelines adopted in 2014.

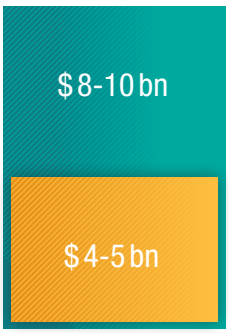
It is therefore possible to roughly estimate current adaptation funding of around $ 8 to 10 billion in 2015 ($ 7 to 9 billion plus $ 1 additional billion via the GCF in 2015 and 2016). Furthermore, it can be estimated that in 2015 half of this, or $ 4 to 5 billion, will be used to support adaptation in the most vulnerable countries.

1. CPI (2014) A Closer Look at Public Adaptation Finance, Climate Policy Initiative.; OECD (2013) Climate-Related Development Finance, Organization for Economic Cooperation and Development.; UNEP (2014) Adaptation gap report, United Nations Environment Program.; World Bank (2011) Economics of Adaptation to climate change, World Bank Group.

2. OECD, 2014.

Figure 10

Share of funding for adaptation from developed countries to LDCs in 2015



Funding for adaptation from developed to developing countries

Share of the funding for adaptation going to LDCs

Source : Canfin/Grandjean, 2015

It is very difficult to assess global adaptation needs, given the weakness of current methodological approaches. Based on the census conducted by the World Bank and used by United Nations Environment Program (UNEP)[1], the adaptation financing needs for LDCs are estimated at around $ 50 billion per year by 2025/2030.

Although it is impossible to quantify the precise needs for adaptation, it is reasonable to assume that estimates will not decrease below tens of billions of dollars per year for the most vulnerable countries alone, even with refined methodologies.

Our propositions for CoP21

Given the increasing impacts of climate change, it is reasonable to presume that adaptation financing needs are growing; this has also been suggested by the above mentioned work of UNEP. Nonetheless, considering the current methodological uncertainties in evaluating financing needs and incremental costs, it is difficult to define a new financial target. Thus, the systematic upstream integration of resilience can significantly reduce incremental costs. As such, CoP21 could lead to a political agreement in principle to set a target for 2020 and beyond, to provide public funding for adaptation for the most vulnerable countries. This should focus particularly on "LDCs, Small Island Developing States and Africa", to use the terminology employed under the UNFCCC. To avoid a repeat of the extended methodological debate that followed the Copenhagen decision on the $100 billion, we encourage a purely public commitment to adaptation to facilitate traceability and using all available tools (grants, loans, loans/grants combined, guarantees, insurance, etc.). Nonetheless, this does not exclude measures targeting private financial flows to support the integration of resilience into their investment decisions.

A set of commitments dedicated to the adaptation needs of the most vulnerable countries could therefore be structured around the following three elements:

- The general decision of all donors and multilateral development institutions to integrate climate resilience by 2020. This should be done in coherence with the G7 declaration of June 2015[2] and the Sustainable Development Goals that make climate resilience a pillar of the development agenda in all relevant sectors (water, energy, agriculture, infrastructure…).
- The extension of existing programs to anticipate extreme weather events (disaster risks reduction programmes), support recovery and reconstruction after natural disasters (World Bank's study on using Cat-DDO[3]) and to insure a higher number of people against the consequences of climate change – as the G7 countries committed in June to do by "increasing by up to 400 million the number of people in the most vulnerable developing countries who have access to direct or indirect insurance coverage against the negative impact of climate change."
- Financial commitment to define a minimum target for public finance for adaptation in 2020 and beyond, dedicated to 'LDCs, Small Island Developing States and Africa.'

1. UNEP (2014) Adaptation Gap Report.

2. "We pledge to incorporate climate mitigation and resilience considerations into our development assistance and investment decisions." G7, Declaration, June 2015.

3. Cat-DDO (Catastrophe Deferred Drawdown Option) is a credit line providing immediately liquidity to member countries of the IBRD (World Bank public credit) following a natural disaster. It is part of a broader range of risks financial instruments from the World Bank Group aiming to support borrowers to plan efficient responses to natural disasters.

4. Commitment taken by North countries in 1969 during a United Nations General Assembly to devote 0,7% of their GDP to official development assistance.

PROPOSITION TO ARTICULATE CLIMATE FINANCE AND DEVELOPMENT FINANCE

The 3rd Conference on Financing for Development, which will take place in July 2015 in Addis Ababa, Ethiopia, will be the occasion for Northern donors to reaffirm their commitment to meet the 0,7%[4] and on a specific objective for LDCs. This is a crucial step on the road to the Climate Conference in Paris in December 2015.

The climate change agenda is in truth a development agenda, as it implies the increased financing for infrastructure that is a prerequisite to development. In addition, the LDCs are also the countries the most vulnerable to the negative impacts of climate change. Climate action, whether dedicated to adaptation or mitigation, is therefore a condition of these countries' long-term development. Nonetheless, taking a short-term perspective, it is necessary to take into account two concerns raised by developing countries. First, that there is a risk of substitution, meaning, for example, that donors may finance fewer schools or hospitals in favor of more solar panels. Second, that there is a risk of limiting progress towards development objectives due to increased costs. For example, the increased cost of producing energy through clean sources may result in a slower rate of increase in access to that energy.

In order to clarify the issues at stake it is necessary to identify, within the finance for development, two categories of sector, distinguished by their relationship to climate change. The first category has a limited climate dimension and includes sectors such as education (in terms of service provided), governance, human rights, and capacity building. It is necessary here to distinguish the service provided from the infrastructure (schools, hospitals, etc.), which could be impacted by climate change.

In the second category, with a more significant climate dimension, are included sectors such as energy and energy efficiency, cities, transports, agriculture, water, etc. These sectors have a direct, positive or negative impact on the climate, and are directly affected by it.

It is thus possible to find a coherent articulation between climate finance and development finance using three typologies:

1 When there is a natural convergence between development and climate – for example, better water management, agriculture and food security.

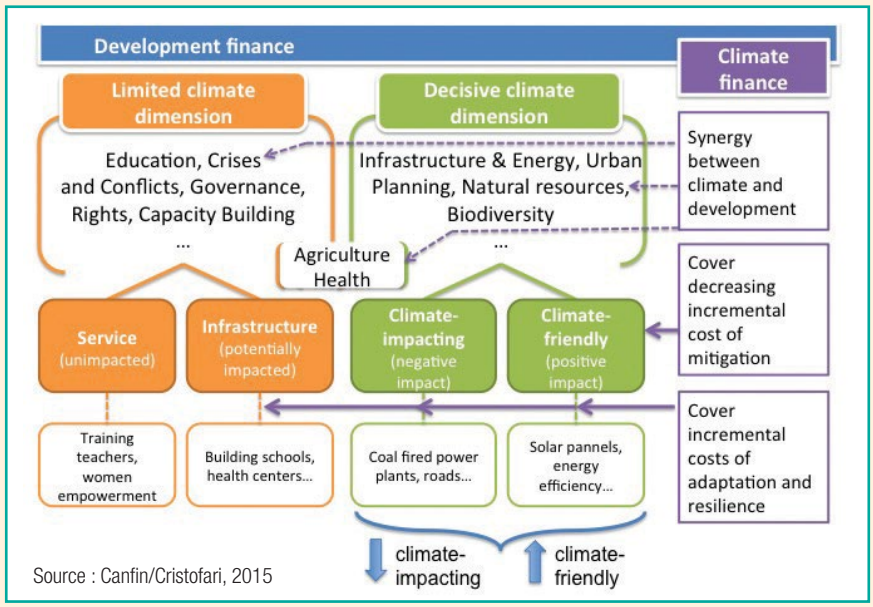
2 When climate finance covers the incremental cost of sustainability. This, it is important to note that this incremental cost is not only decreasing, but is also increasingly small. For example, the construction of a wind farm rather than a coal-fired power plant.

3 When climate finance covers the incremental cost of adaptation of a project for which there is no business model for private sector – such as the construction of a dyke. Furthermore, this could include integrating increased resilience into standard projects, in particular those related to infrastructure; for example, the construction of a resilient health center or school.

This articulation can be illustrated using the following flowchart.

Therefore, addressing the tensions between climate finance and development finance is one of the most efficient means to ease the "mainstreaming" of climate change when it is necessary and consistent with the Sustainable Development Goals that will be adopted in September 2015. ■

Figure 10 Articulation of development finance and climate finance



Source : Canfin/Cristofari, 2015

2.3 THE CURRENT MACROECONOMIC CONTEXT IS AN OPPORTUNITY FOR LOW-CARBON INVESTMENT

The current macroeconomic context is characterized by slowed economic growth, both in developed and developing countries. A number of factors have caused a slowdown of the capital stock increase: the risk of a 'secular stagnation'[1] in developed countries, due to a potential growth that will increase at a lower rate than before the crisis; the predictable effects of demographic growth (population aging); and the long-lasting effects from the crisis[2].

In response to the financial crisis, central banks of a number of high-income countries launched accommodative monetary policies with the double objective of heading off a collapse of the financial system, and stimulating economic growth through monetary means, in accordance with their mandate.

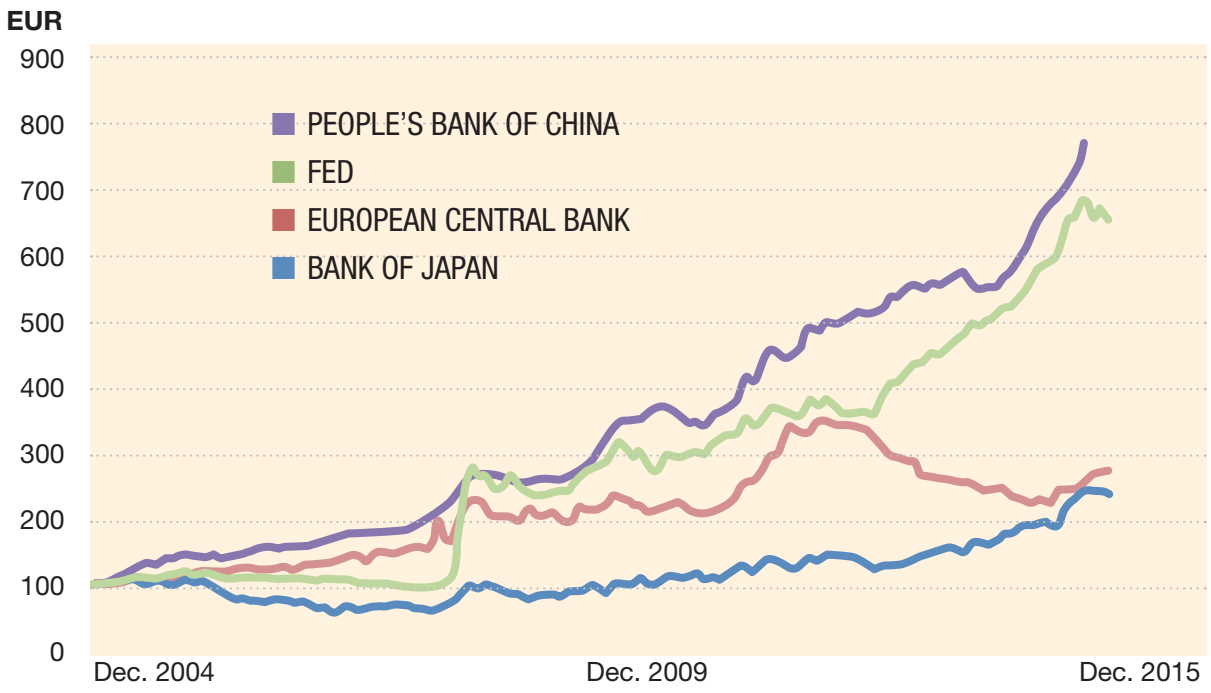
The Bank of Japan expanded its monetary easing in October 2014, and the European Central Bank (ECB) launched an asset purchase program in January 2015, which included the purchase of government bonds. The US Federal Reserve (FED) began reducing its quantitative easing program at the end of 2014. However, it continues to maintain its benchmark interest rates at very low levels. It has, however, been the People's Bank of China that has increased its balance sheet at a faster pace than these other three Central Banks over the past few years.[3]

1. Robert Gordon (2014) The turtle's progress : Secular stagnation meets the headwinds in Secular Stagnation : Facts, Causes, and Cures, Centre for Economic Policy Research

2. IMF (April 2015), World Economic Outlook.

3. At the end of 2014, the People's Bank of China's assets include approximately 80% of exchange reserves, the central bank buys dollars from foreign commercial flows and converts them in Yuan. In order to avoid the inflation that this action could generate, the People's Bank of China imposes the countries' banks legal a reserves rate of 18.5% (Bloomberg).

Figure 12 The growth of central banks' balance sheets since 2008



Source : CDC Climat Research after datas from European Central Bank, Federal Reserve Board, Bank of Japan, People's Bank of China and ECB staff calculations.

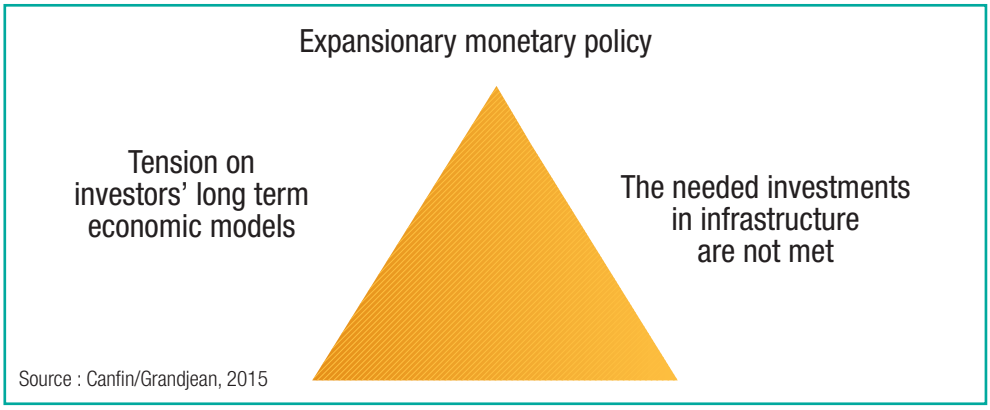
In developed countries, these policies are maintain interest rates on long-term government bonds at a very low level, which reflect the forecast of actors anticipating low growth in their economic perspectives. In March 2015, a 30 years mortgage was priced at 4% in the United States, 2% in Italy, and less than 1% in Germany and Japan.

With the notable exception of China, the global economic context is also marked by a deficit of long-term investment, particularly in terms of infrastructure. The NCE[1] has gone so far as to evoke a *"broken infrastructure development model."* In Europe and the United States, the stock of infrastructure dating from the 1960's is now aging and has been only partially renovated. In developing countries, the lack of infrastructure has often been and remains one of the major obstacles to private investment and development: the installed electricity output capacity of the emerging countries is only a fifth of that of developed countries, 25% of the inhabitants of India and 62% of the Nigerian population do not have access to electricity at all.[2]

Currently, the stock of infrastructure and associated assets does not grow quickly enough to meet the rising demands of institutional investors from developed countries, who manage pensions and savings funds. These investors control an estimated total pool of $ 90 trillion in assets and net annual investment flows of $ 5 to 8 trillion[3]. Of this, only $1 to 2 billion is currently invested in long-term infrastructure assets. The business model of institutional investors is increasingly strained, given low long-term interest rates and the growing needs of an ageing population. These institutions are actively advocating for increased infrastructure investment, and have communicated their readiness to invest massively in low-carbon infrastructure – provided the conditions of stable and long-term returns, which they require as part of their fiduciary duty, are met.

A unique opportunity therefore arises from the convergence of three factors that support the financing a low-carbon economy.

Figure 13 The triangle of paradoxes



Source : Canfin/Grandjean, 2015

1. NCE, 2014.

2. According to World Bank indicators, 2010-2014.

3. NCE, 2014.

In October 2014, the IMF called for stimulation of the world's economy by the launch of an infrastructure investment program. In a sample of high-income countries, an increase in investment by the equivalent of 1% of GDP is estimated to trigger a growth in output of 0.4% over the same year, and of 1.5% four years later[1]. The IMF has emphasized that the economic slowdown and the accommodative monetary policy are contributing to the maintenance of low interest rates, when they could otherwise increase due to the rise in investment. It is therefore crucial to incite the transition to a low-carbon economy before the inevitable increase in interest rates.

The transition to a low-carbon economy is therefore an opportunity to scale up infrastructure deployment at a time when investors in both developed and developing countries need it, while the present low interest rates offer a window to finance this transition at a historically low cost.

To conclude, the infrastructure necessary for the low-carbon economy transition is composed of real assets that are net creators of jobs. While the low-carbon transition does imply sectoral reallocation of jobs, it will nevertheless expand employment in construction, operation, and research and development related to the new, low-carbon technologies involved. Energy efficiency investments are also sources of increased productivity. In the current context of weak economic growth in most developed countries, the transition towards a low-carbon economy is not only a powerful means of protecting society from the threat of climate change, but also a means to create jobs.

2.4 THE ROLE OF DEVELOPED COUNTRY CAPITAL IN FINANCING LOW-CARBON DEVELOPMENT IN THE DEVELOPING WORLD

Given the large scale of investment needs in the developing world, most of the finance necessary for the low-carbon transition will come from domestic sources within developing countries. In many developing countries, domestic savings do not find sufficient opportunities for local investment, particularly over long maturities. Therefore part of this capital is currently invested in the financial markets of developed countries.

A number of initiatives are arising, notably in China, to structure green investment funds to provide investment in the region (e.g. Asian Infrastructure Investment Bank, the New Development Bank, Silk Road Fund). The joint report of UNEP-FI and the People's Bank of China, released in May of 2015, indicates that these funds aim to apply the Ecuador Principles[2] to their investments in the region. This is an important step to avoid the danger of having a two-tier framework of environmental standards in emerging economy countries.

1. IMF (2014) World Economic Outlook.

2. The Equator Principles are principles used by major international banks to integrate social, societal and environmental factors within financing frameworks. These principles serve as a basis for a responsible finance and respect World Bank standards.

THE DEVELOPMENT OF SOUTH-SOUTH COOPERATION

The present report focuses on North-South financial flows; an analysis of the role of the development of South-South cooperation is beyond its scope. Nonetheless, it should be mentioned, for example, that the New Development Bank (NDB) will normally have a total capital of $ 50 billion, including 20% callable capital. The Asian Infrastructure Investment Bank (AIIB) should possess a total initial capital of $ 100 billion, including 20% callable capital. The Silk Road Fund was endowed of $ 40 billion. Based from these data and, building on the experience of other Multilateral Development Banks (MDBs), it is possible to roughly estimate that the NDB's portfolio could reach an amount of about $ 50 billion in the medium term, whereas the activities of AIIB could reach $ 100 billion. These banks will necessarily intervene in infrastructure financing, in relation to the climate agenda, whether it is for mitigation or adaptation.■

The majority of current private sector climate finance for developing countries currently flows to three countries: Brazil, India and China.[1] The private sector is proportionally more involved in providing climate finance in developed countries (88%) than in the developing world (57%). The repartition of these private climate flows is as follows: developers of small- and middle-size renewable energy projects 50%; industrial companies 30%, banks 20% while institutional investors only financed less than 1%.[2]

This high share of renewable energy projects can be linked to the fact that many of them are relatively stand-alone, supplying power directly to one or more end users, sometimes off-grid. Financially, related project risk is reduced by a number of factors, for example: the relatively small project size in comparison to large-scale infrastructure; the involvement of export credit agencies in financing equipment; relatively short construction periods; and improved returns due to the spectacular decrease in equipment and production costs[3]. However, the small size of project sponsors and their respective balance sheets, combined with the required rapid return on invested capital, prevents them from investing in larger-scale infrastructure, such as transport networks for electricity, water or data.

Institutional investors in developed countries possess vast sums of capital, and have indicated their willingness (for both financial and reputational reasons) to finance low-carbon infrastructures in the developing world. At present they have begun to do so in a limited fashion. However, their role could be crucial for the transition:

– Public capital could contribute to the development of local financial markets, and to the emergence of low-carbon projects via the provision of guarantees for select risks (see Section 3.5.3).

1. Private Participation in Infrastructure Research Group, (2013), UNEP & BNEF, (2013).

2. Vivid Economics (2014) Financing Green Growth.

3. NCE (2014) Better Growth, Better Climate.

– Institutional investors are able to offer long maturities, when the maximum tenor for infrastructure financing currently available is 10 years. This even in China, which has one of the most developed financial markets among emerging economies.

The issue of finance maturity and tenors is key. Indeed, the profitability of an infrastructure investment is highly dependent on the duration of the financing. As initial investment costs increase, longer depreciation and financing timespans are necessary so that the cost may be spread over time. Most infrastructure investments cannot generate profits over short time periods. Yet, the duration of concessions and depreciation depends not only on legal and accounting frameworks in the country, but also on the tenor of the financing available. If financing is only available for a tenor shorter than the depreciation (for example a 10 year tenor for a metro project amortized over 30 years), there is a risk that the project will not be able in year 11 to refinance at an acceptable adequate cost (refinancing risk). Most of the borrowers refuse this level of risk and therefore the project will not be able to procure funding from the beginning.

Given the lack of domestic financial markets offering long maturities, many developing countries can only finance infrastructure out of public budgets, which are often constrained by high levels of existing debt. The energy transition can thus also be an opportunity to foster the development of longer maturities in domestic financial markets, which is in itself a part of broader development objectives (including domestic savings and tax collection). Developed countries can play an important role in assisting developing countries, notably via Development Banks. These can both provide financing and foster the development of long-term infrastructure projects. This in turn can create benchmarks for the domestic financial markets, enabling newly developed markets to better retain and manage domestic savings.

2.5 IDENTIFYING BARRIERS TO BETTER OVERCOME THEM

2.5.1 The over-arching barriers to private sector involvement in low-carbon investment

In order to identify those measures with the highest potential impact, it is important to first identify the obstacles to the inflow of capital from the global North, particularly the large sums managed by institutional investors, aimed at financing the low-carbon transition in the global South.

The first barrier is conceptual in nature. For most investors in developed countries, climate finance is principally equated with financing of renewable energy. While renewables are an important component, the transition to a low-carbon economy also requires massive investment in urban development, public transport, energy efficiency, waste and water facilities – sectors to date poorly identified as opportunities by investors. This is thus one of the reasons why the introduction of labels and standards for the financial sectors to identify green investments is a priority.

As such, the limitations to leveraging financing from the North to support low-carbon investment in developing countries reveal many of the broader difficulties that all infrastructure projects in these countries face. There are nevertheless a number of obstacles specific to the low-carbon transition:

– A higher dependency on a stable, long-term regulatory environment : i.e. the use of feed-in tariffs and other support mechanisms that must be perceived as established credibly over long periods of time;

– The necessity for governments to establish credible and reliable regulatory frameworks, as well as to act as creditworthy counterparties in both public sector projects and private sector projects involving a public utility;

– Low-carbon technologies (e.g. energy efficiency, transport, etc.), for which information on investment costs and future performance is relatively scarce. Furthermore, these technologies often fall outside existing asset classes with proven track records that facilitate institutional investor participation;

– Transversal and systemic nature of changes needed for low-carbon development: in the case of transportation, the development of a low-carbon fleet of vehicles, new engines and the production and supply of low-carbon fuels need to occur in parallel. Facilitating the development of “compact cities” requires integrated upstream planning and technical engineering; for instance, low-carbon and resiliency requirements must be integrated at the design stages for roads, buildings, transport systems, etc. Yet, many planning bodies for urban areas in emerging and developing countries do not have the capacity to enact the upstream integration of climate-related issues. This is principally a challenge to be overcome by national and sub-national governments, however development finance institutions can also play a role.

To demonstrate a number of the other barriers to private sector investment, Box 6 presents the obstacles identified by the Private Sector Facility of the Green Climate Fund.

BARRIERS TO PRIVATE SECTOR INVOLVEMENT IN LOW-CARBON INVESTMENT, ACCORDING TO THE GREEN CLIMATE FUND (2013)

A Higher up-front costs: Most climate-related investments impose higher up-front costs. This is true for projects that help abate carbon as well as projects that raise adaptive capacity. Even where an analysis of life-cycle costing shows that the costs are similar to, or less than, the costs associated with current alternatives over the life of a project, commercial interest is often dampened due to the longer pay-back periods and therefore the lower immediate return.

B Greater technological risks, especially under local conditions: Most climate-related technologies have not penetrated local developing country markets. The technological risks in private investment can therefore be high.

C Limited relevant expertise/capacity among the actors involved in delivering climate actions: A lack of capacity and expertise can be seen in every element of the value chain of investments designed to address climate change, and extends to relevant financing, regulatory and governance institutions.

D Nascent stage of climate-related technologies: The supply chain for most climate-related technologies is in an emerging state and thus underdeveloped in most countries. The lack of scale and mature ecosystem of players along all relevant segments of the value chain of climate-related investments increases transaction costs and dents the confidence of potential private investors. This is aggravated by an absence of transparency as evidenced by the lack of strong regional aggregators along the value chain.

E Lack of awareness: Industry, especially micro, small and medium industries, and also consumers and communities are often unaware of options for addressing climate change. This lack of awareness also extends to municipal and local bodies, financial and regulatory bodies and local governance institutions.

F Limited capital market instruments: Due to underdeveloped capital markets, financial instruments that correctly price risk are either unavailable or unaffordable.

G Third party risks: Many local and foreign investors perceive foreign exchange availability, regulatory uncertainty and the risk of default by local institutions (such as energy and water utilities) in honoring their obligations as major impediments to private investment in general and costlier climate investments in particular.

H Absence of adequate local institutional capacity: In many developing countries, local institutions that can lead the fight against climate change are either absent or, when present, lack the required technical and financial capacity to make a difference. ■

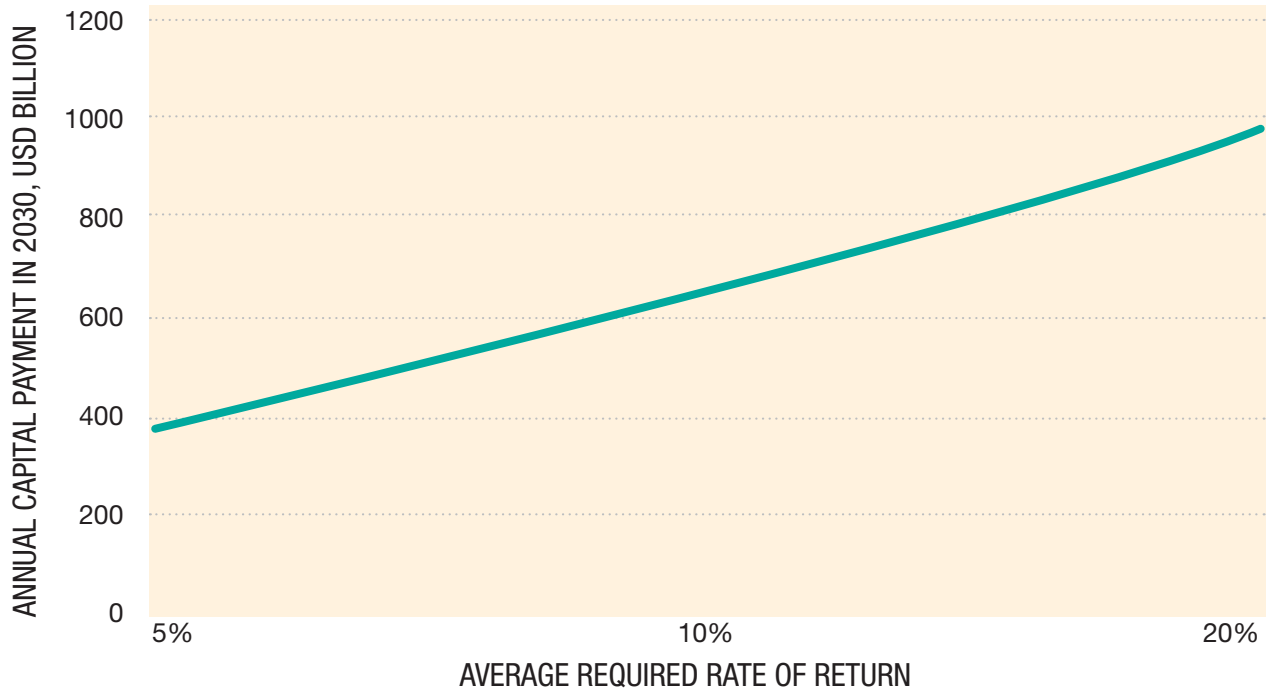
2.5.2 Improving the risk/return profile of investments

Institutional investors in high-income countries have a fiduciary duty vis-à-vis their clients who have entrusted them with the management of their capital. They are therefore obliged to invest prudently to respect this duty. Given the low level of interest rates in high-income countries, several institutional investors auditioned by the present Commission expressed their interest in the opportunity to invest in low-carbon assets in developing countries – even with a relatively low multi-sector average of returns of 2 to 4%. These investors are currently not deterred by the modest returns of low-carbon investment in developing countries, but rather by what they perceive as high risks. These include political, institutional and regulatory instability; technological risk; and country exposure to other external factors. In order to cover those perceived risks, an infrastructure project in the developing world must often generate a higher return than it would in a developed economy. This is a critical barrier to development.

Some of the measures recommended in this report aim to lower the perceived risks associated with investments supporting the low-carbon transition; and therefore aim to reduce the cost of financing – with an expected effect on the cost of the transition itself.

It is essential to note that a decrease of a single percent in the required rate of return by investors could represent at the scale of the transition a decrease in capital repayment costs of around $ 40 billion per year in 2030 (see Figure 14).

Figure 14 Every 1% increase in the required rate of return increases capital costs by $ 40 billion per year



Source : Vivid Economics 2014. Note : Assumes all mitigation investments are written down overs 20 years

It is therefore key to reduce the cost of the capital that will finance the transition to a low-carbon economy. The following box presents three of the principal components of the cost of capital for infrastructure projects that are covered in more detail in Section 3 of this report.

1. According to the Capital Asset Pricing Model (CAPM) formula, established by Modigliani and Miller in 1963 and universally accepted.

THE COST OF CAPITAL FOR AN INFRASTRUCTURE PROJECT COMPANY - AND HOW IT CAN BE LOWERED

A project company is an ad hoc private company, created specifically to house and finance an infrastructure project. The project is 'ring fenced' from the balance sheet of both the private sponsor (company) and the public sector (local authority, State, etc.).

1. The discount rate and the rate of return of an investment project

Discount rates play a key role in the calculations investors make to estimate the Net Present Value of future cash flows. For example, the present value of a cash flow of € 110 received one year from now is € 100 using a the discount rate of 10%. It is € 103 with a 7% discount rate, and € 96 with a 15% discount rate.

A high discount rate will make near-term cash flows relatively more important than later cash flows in the present value calculation and therefore prevents the prioritization of longer-term concerns, whether positive or negative.

In other temrs, an investment in an infrastructure project implies an initial expenditure in the year N and creates revenues in the years N+1, N+2 etc. The methodology presented here assumes that the project is housed in a dedicated Special Purpose Vehicle (SPV) and is only applied to cash flows, as only these can be discounted. A social cost of carbon, for instance, cannot be discounted using the same methodology as its future value is not dependent on the capital remuneration rates available in the market.

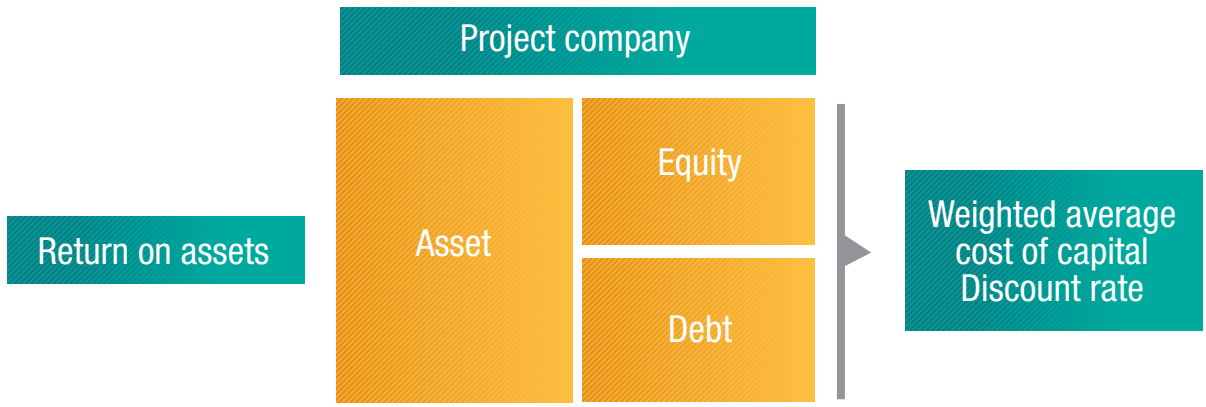
The present value of future cash flows is the sum of future cash flows of each year, at the chosen discount rate. The internal rate of return (IRR) is the rate that equalizes present value of future cash flows and initial investment.

2. Financing an investment project

An investment project will be financed by private investors only when the profitability of the project, or the IRR, is positive, and considered sufficient when set against internal benchmarks. At the time of the investment decision, both equity and debt investors use discount rates to compare future cash flows of projects to investment costs. The discount rate[1] is adjusted to include all perceived risks associated with the cash flows.

In practice, the use of this rate can be simplified in the following manner:

Figure 15 A project company financing model



Source : Canfin/Grandjean, 2015

The project is structured by its initial shareholders (sponsors): they structure the necessary contracts (duration, product sale price, etc.) so as to be in a position to offer lenders an acceptable level of risk at an acceptable price for themselves. Whether debt is structured as a bank loan or as a bond issuance), lenders typically will not accept certain risks (e.g. construction risks); they will require that a third creditworthy party (such as the construction company) provide a guarantee. For the residual risks that they will accept, the lenders will charge a price premium. This cost will reflect the premium commensurate with their perceived exposure to residual risks: i.e. revenue risk, country risk, technological risk, etc. This premium is added to the non-risk weighted cost of funding.

The return for the shareholders is dependent on the difference between the discounted project revenues and the cost of debt. This is therefore negotiated between shareholders and lenders. If lenders price debt is too high given the perceived project risks, shareholders may consider the returns on their capital insufficient. In the end, the global cost of capital for the project (or Weighted Average Cost of Capital) is the average between the required rate of return by shareholders and the cost of debt. In economic terms, the cost of capital must be kept below the returns from project assets (or Return on Capital Employed). When it is not possible to optimize the project risk-sharing structure to this effect, the project cannot be financed by private actors.

As a general rule, equity investors in a private project require returns on capital in the order of 15% to 20% per year. The lending rates for infrastructure projects are typically below 5% per year. If the project is financed with 20% equity (with an expected 20% return) and 80% in debt (with an interest rate of 5%), the average cost of capital is 8%. In this example, the project must therefore deliver returns of at least 8% per year. This level of returns is out of reach for many low-carbon projects, whose socio-economic benefits are not included in the above financial calculations. However, the earnings expectations of both lenders and shareholders are highly dependent upon the structure of the SPV contracts. External guarantees (whether from a contractor, from a third-party for revenues, or from the Government in the case of revenues of a Public Private Partnership), can drastically reduce the expected risk-weighted returns of all parties. Moreover, the cost of borrowing may be reduced by external factors (credit enhancement by an insurance company for instance), or by internal factors linked to project structuring (subordinated debt or a first loss guarantee). Finally, the project lifetime and the tenor debt of financing directly influences the length of time over which the initial investment can be amortized. This is a key issue which can render an infrastructure project financially feasible when annual revenues must be relatively low in order to be acceptable for the end user and/or the tax payer.

The risk-sharing structure of the project involving all parties, as well as the support of the public sphere (from both developed and developing countries), are key elements that make an infrastructure project possible financially feasible.

3. How to lower the cost of capital of low-carbon infrastructure projects

The following factors linked to project structuring can contribute to reducing the cost of capital of a low-carbon infrastructure project:

– Increase the project duration and amortization length: included in both the call for tenders, availability of finance with long maturity and tenors.

– Subsidies and/or tailored feed-in tariff support schemes.

– Creditworthy third party guarantees (governmental, constructor).

– Reducing risk for lenders through internal risk-sharing agreements and tools (subordinated debt, third party guarantees, political risk guarantees, credit enhancement).

– Concessional or low-interest rate loans.

– Make visible the expected impacts due to climate change on infrastructures in order to value those that are resilient to these impacts, and allow them to benefit from a lower risk premium.

All of these options are more readily available through the inclusion of development finance institution in the project. ■

2.5.3 The high level of transfer risk for many developing countries' currencies

When investors from the North invest equity (stocks) or debt in a project in the South – whether public or private, they are repaid in the local currency. They must convert this local currency back into their original currency to recover their investment. At present, only 18 currencies in the world are freely convertible[1]. The conversion of all other currencies to a developed country's currency must be submitted for approval to the applicable national or currency-zone Central Bank. This Central Bank could decide to block the transfer, either for lack of available currency or for other motives. This risk is referred to as "transfer risk". Transfer risk should not be confused with foreign exchange risk, i.e. the risk of a variation in the respective value of two currencies. In most cases, foreign exchange risk can be hedged by commercial banks.

HEDGING TRANSFER RISK

Transfer risk is generally hedged, for lenders banks, by Multilateral Development Banks via an intervention structure called 'A Loan/B Loan.' For example, the credit, allocated to a steel mill in Kazakhstan totals $ 600 million. The MDB structures and syndicate the loan: it takes a share, referred as 'A,' of $ 100 million for example, and syndicates $ 500 million to Northern commercial banks that provide the loan for a share referred as 'B.' The transfer risk from lenders of the 'B' share is hedged by the MDB: if financial flows from the loan cannot be transferred into the desired currency because the Central Bank of Kazakhstan cannot honor the transfer of these flows, borrowers are repaid by the MDB. The latter will then request the transfer of all financial flows into local currency (its own 'A share' and the flows of the 'B share') to the country as part of its 'Preferred Creditor Status' in the developing country. In other words, it means that the MDB, and its claims, has priority status in developing country, and thus will be prioritized when the Central Bank reopens exchange, or during negotiations of the debt restructuration if the situation remains blocked.
Hedging transfer risk is essential for commercial banks of developed countries so they can accept to intervene in a financing a project in developing countries. This risk may be deemed as low if the country possesses significant developed country currencies in its reserves. In order to offer this type of loan structure, an MDB must possess have, owing to the agreements that is has with the project host country, a 'Preferred Creditor Status.' Members of the 'MDBs Club' (World Bank, International Finance Corporation (IFC), African Development Bank (AfDB), Asian Development Bank (ADB), European Investment Bank (EIB), European Bank for Reconstruction and Development(EBRD)) already have this status with the countries they intervene in. This status allows them to attract financial actors from developed countries to investment projects in the developing world. ■

2.5.4 The challenge of transforming needs into bankable projects

In the barriers mentioned so far, there is the assumption that project are available to finance, whether a low-carbon power plant, or a public transport network. However, the experts auditioned for this report pointed out the lack of projects in developing countries in general, and in particular those aligned with a low-carbon transition.

1. On 30 September 2013 these currencies were : Australia Dollar, Bahrain Dinar, Canada Dollar, Denmark Krone, Euro, Hong Kong Dollar, Kenya Shilling, Kuwait Dinar, New Zealand Dollar, Norway Krone, United Kingdom Pound, Singapore Dollar, South Africa Rand, Saudi Arabia Riyal, Sweden Krone, Switzerland Franc, United Arab Emirates Dirham, United States Dollar.

In both developed and developing countries, project developers need to shoulder the following costs in order to transform a low carbon equipment need into a bankable project:

– Costs of technical feasibility studies: initial cost evaluation, construction, physical and/or geological surveys, traffic or market study, environmental impacts survey, etc.

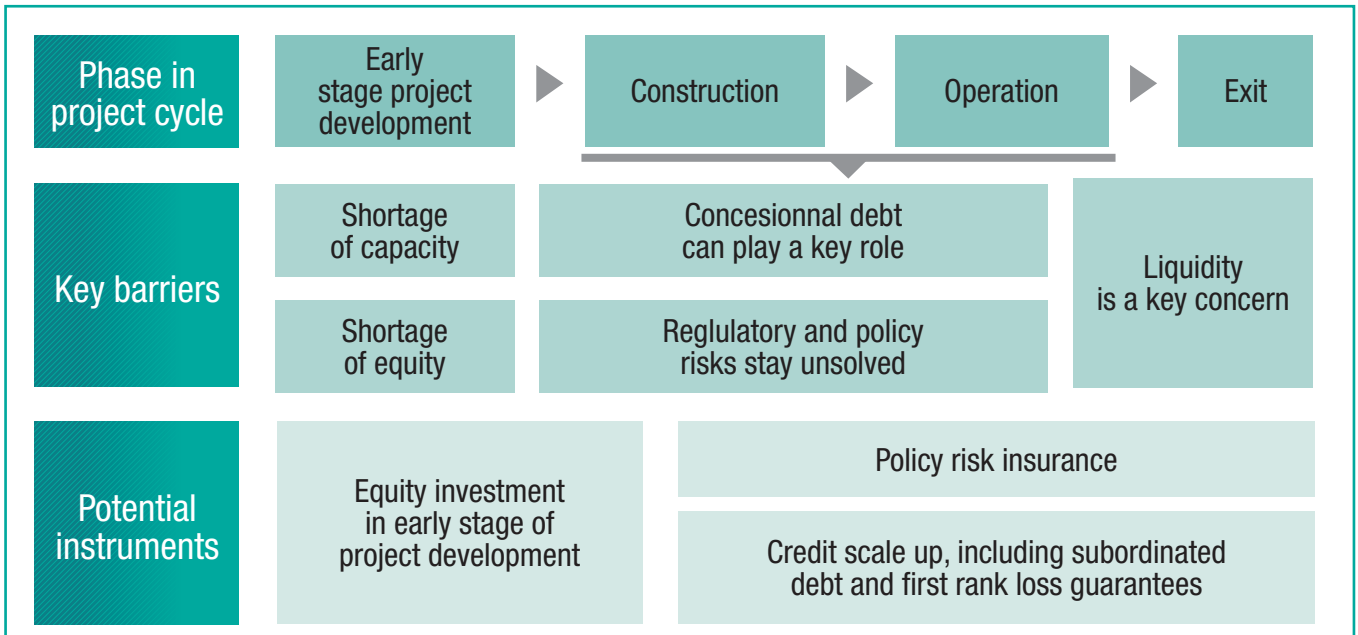
– Costs of legal feasibility studies: cost and delay of licenses, permits, ownership rights, etc.

– Costs of financial feasibility studies: selecting between public-led or private-led projects, bidding procedures, the potential role for development banks, tax structure, etc.

Such project development costs represent significant amounts of money and time. Project developers can be industrial groups interested in technology dissemination or in developing new markets. They can also be investment funds interested in infrastructure equity. They are highly specialized in specific industrial sectors and often team up with industrial sponsors. The business model sufficient to cover these development cost relies on a larger portfolio of projects: returns from successful projects must not only cover their own costs, but also the development costs of failed projects. This business model generates, a de facto, barrier to entry in new sectors, such as low-carbon investment, where technology and the financial environment are still new and comparatively uncertain. Furthermore, this model acts as an incentive for larger projects, in which the high entry costs are more easily covered if the project succeeds. With the exception of renewable energy, smaller projects currently remain outside the scope of most development finance, whilst in developing countries, where basic infrastructure is often lacking, small projects could present opportunities for both job creation and development.

The following chart summarizes the key obstacles to financing of projects coherent with the low-carbon transition.

Figure 16 Gaps in the types of support provided to improve access to finance



Source : Canfin/Grandjean after Vivid Economics, 2014

3. THE ROADMAP TO FINANCE A LOW-CARBON ECONOMY

3. THE ROADMAP TO FINANCE A LOW-CARBON ECONOMY

3.1 10 KEY PROPOSALS

1 Establish a monitoring process for the low-carbon financial roadmap to ensure its longevity beyond CoP21. The IMF and the World Bank could be charged with the supervision and implementation of this roadmap, in coordination with the institutions deemed relevant to perform this task, particularly within UNFCCC. The objective will be to monitor, in particular, the development of the carbon price signal (including phasing out fossil fuel subsidies), the reforms allowing the removal of barriers to investment in low-carbon infrastructure, the '2°C roadmaps' of development banks, the integration of climate risk in financial regulation, the relative volume of 'green' investments compared with total global investments in infrastructure and the evolution in the decoupling of GDP and greenhouse gas emissions. ■

2 Establish a carbon price signal. A voluntary commitment from developed and emerging countries to put an explicit carbon price signal into effect, between a minimum target price of 15 to 20 dollars/ton of CO2 in 2020, and a maximum target price of 60 to 80 dollars/ton of CO2 in 2030/2035, according to levels of development. ■

3 Integrate climate in macro-economic models. The integration of a 2°C scenario throughout the macroeconomic forecasts and models of international institutions (IMF, OECD, etc.) and finance ministries in order to ensure a better coherence between short-term analysis and forecasts, and long-term low-carbon objectives. Any model or forecast, for example energy market forecasts, that is incompatible with the 2°C limit should be explicitly identified as such. ■

4 Development of national strategies to finance the decarbonization of the economies. Governments, beginning with developed countries, should produce national decarbonization strategies for their economies, covering the needed financing, both public and private. France has adopted the principal of such a strategy in its law on the energy transition for green growth; the G7 countries also committed to this principal in June 2015. Among the key indicators for such strategies could be the relative volume of 'green' investments compared with total global investments made each year, combined with annual targets. France could propose to that IMF and the World Bank monitor this indicator, country by country, and to aggregate investment levels at the global level. ■

5 Request that each development bank to develop a '2°C investment roadmap' compatible with the 2°C limit. This roadmap should specify how the development banks intends to contribute to the fulfillment of the 2°C limit agreed to by the international community. A joint monitoring process by multilateral, regional and bilateral development banks could be established, with a public report presented every two years during General Meetings of the IMF and the World Bank. ■

6 Increase the use by development banks of instruments and tools with high leverage ratios, such as guarantees, subordinated debt or credit enhancement, to increase climate finance at comparatively low costs. France could request development banks to estimate their capacity to mobilize additional climate finance through an increased use of these tools.
In the particular case of France, the Agence Française de Développement (AFD) is today the only international development finance institution subject to Basel 3 prudential regulation. According to our estimations, if aligned with the prudential frameworks used by other development banks, the AFD could increase its activity by € 1 to 2 billion. ■

7 Include in the 2016 G20 work program the forthcoming recommendations of the Financial Stability Board (FSB), which was mandated in April 2015 by G20 finance ministries to analyze the potential impacts of climate change on financial stability. ■

8 Request that the Bank for International Settlements (Basel Committee) define methods to include climate risks in stress tests for banks and insurance companies. This should include methodologies to assess the performance of assets held by banks and insurance companies in the +4°C scenario as developed by the International Panel of experts on Climate Change (IPCC). France, in partnership with other countries, could formally request the Basel Committee on this issue. ■

9 Establish a public monitoring system for financial actors' engagements that have multiplied in recent months, including: the integration of climate risk; measuring greenhouse gas emissions induced by their financial activities; and increasing financing for the green economy. The UNFCCC's Nazca Platform, which centralizes these commitments, can be used and further developed by CoP21 in order to increase the visibility of progress in this area within the broader 'Agenda of Solutions.' These commitments could be comprised in an annual public report.
In the particular case of France, the recently voted provisions of the energy transition for green growth legislation require institutional investors to measure the greenhouse gas emissions linked to their financial activities and to explain how they address the 2°C scenario. These same provisions could be usefully extended to private banks concerning their lending activities. ■

10 Adopt the methodology developed by the OECD in June 2015 to analyze the alignment of public policies with low-carbon development. This is a key means of assessing the integration of progressive decarbonization targets in all public policies. We propose that France be part of the first countries to commit to apply this framework internally and urge other member countries of the OECD and OECD key partners[1] to do so before the CoP21.
In the particular case of the European Union (EU), the financing of the Juncker Plan totaling € 315 billion could be made conditional on climate co-benefits criteria and projects related to the implementation of the low-carbon transition could be prioritized (energy efficiency and technology projects). France could communicate broadly on its recent legislative developments to integrate climate issues into financial regulation. The French government could propose to its European partners to move forward in this direction. *France could therefore request that the European Commission addresses this issue and proposes a plan of action for the next 2 to 3 years to be delivered ahead of CoP21.* ■

1. OECD Key partners are Brazil, China, India, Indonesia and South Africa.

WHY DOES THIS MATTER TO DEVELOPING COUNTRIES?

Developing countries remain largely outside of existing international private capital flows. The reallocation of these flows is therefore principally an issue for developed and emerging countries. Nevertheless, the proposed agenda to reorient private capital flows holds significant benefits for developing countries.

1. Firstly, mitigation action and the achievement – or not –of the 2°C limit by developed and emerging countries will have direct consequences on the most vulnerable countries. The sooner investment flows are 'greened,' the less severe the impacts from climate change will be.

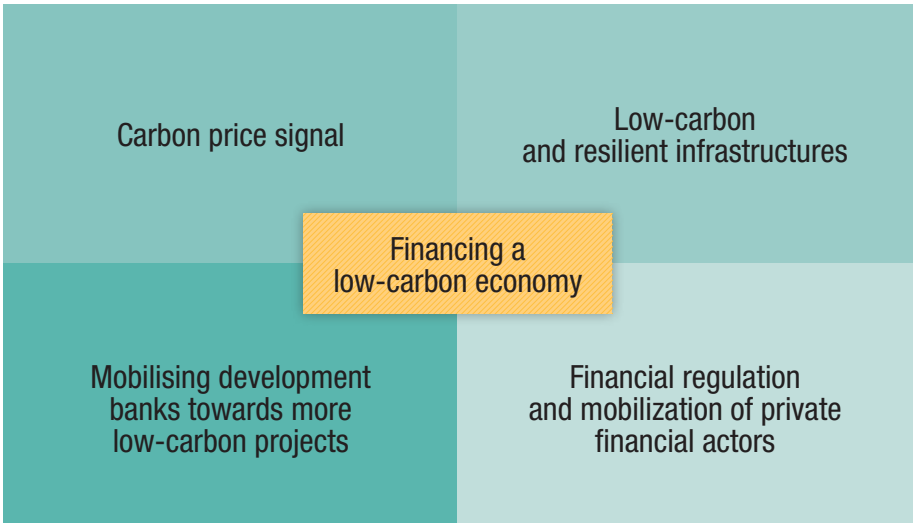
2. An increasing number of African countries are seeing the development of domestic capital markets (Nigeria, Kenya, Ethiopia). These countries will benefit from the work realised to integrate climate issues into market regulation, both in terms of information systems and risk management..

3. The additional mobilization of risk hedging tools by development banks will allow private investors to invest more easily in countries that they do not consider today as part of their investment universe.

4. Developing and emerging countries host many of the central banks that are the most active in channelling domestic financial flows towards green projects. Bangladesh is a striking example, as well as Brazil, China, Indonesia.[1] This is thus not only an issue on the 'Northern political agenda,' but on the contrary, a common concern that has already found concrete translation in the global South; at least as much as in the North. This increases the potential of international cooperation on the matter.

This report provides, apparently for the first time, a roadmap to finance a low-carbon economy that comprehensively deals with four fundamental dimensions: carbon price signal, low-carbon and resilient infrastructures, development banks, financial regulation and mobilisation of private financial actors.

Figure 17 The four dimensions of a low-carbon financial roadmap



Source : Canfin/Grandjean, 2015

1. UNEP Inquiry (2015) *The coming financial climate.*

3.2 THE CARBON PRICE SIGNAL

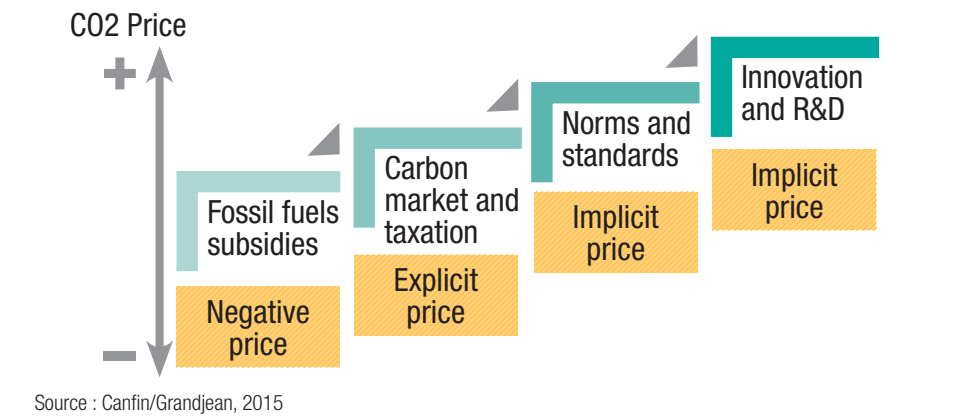
Including the cost of climate change – considered as a negative externality – in the price of goods and services is one of the principal means of incentivizing markets, companies and consumers to support a low-carbon economy. This can be done by putting a price on carbon; which can occur concretely – depending on political choices and local regulations – through carbon markets, taxes and charges, the implementation of emission norms and standards, the use of a shadow or social cost of carbon (for public investments or development banks), among other measures.

The importance of putting a price on carbon has gathered a large consensus. This includes not only academic literature, but also numerous international institutions such as the United Nations Global Compact[1], the World Bank[2], and the IMF [3],among others. Furthermore, an increasing number of companies are also in favor of a carbon price. This has been clearly demonstrated by the large number of signatories to the call for action launched in September 2014 in New York[4]; the declaration of the Business and Climate Summit[5], which has been signed by more than 6 million companies; or most recently by the request of six oil and gas majors for the introduction of a price on carbon[6]. According to the Global Commission on the New Climate Economy, around 12% of global CO2 emissions are currently covered by a carbon price. Today, 40 countries have put into place a tax or a carbon market. These include multiple Latin American countries such as Mexico and Chile, but also Japan and eventually South Africa. In China, an emissions trading scheme has been tested in 7 provinces and will be extended nationally from 2016. Furthermore, 73 countries along with 11 sub-national states and provinces – responsible altogether for more than half of global carbon emissions – officially announced their support for the adoption of a carbon price during the Ban Ki Moon Summit in 2014. However, the progress made on the introduction of a price on carbon remains inadequate for widespread changes in investment decisions. We make the following proposals.

3.2.1 Establishing a 'carbon price corridor'

A first-best option would be to set a single, global price on carbon. However, it is necessary for this price to take into account the levels of development of different countries, as well as the significant variation in price levels necessary to shift investments and economic models in different sectors. Furthermore, the implementation of a carbon price can be achieved using a variety of tools, as illustrated in Figure 18.

Figure 18 Different methods of putting a price on carbon



Source : Canfin/Grandjean, 2015

1. https://www.unglobalcompact.org

2. Carbon pricing leadership coalition : http://www.worldbank.org/en/programs/pricing-carbon#2

3. IMF (2014) How Much Carbon Pricing is in Countries' Own Interests? The Critical Role of Co-Benefits, International Monetary Fund.

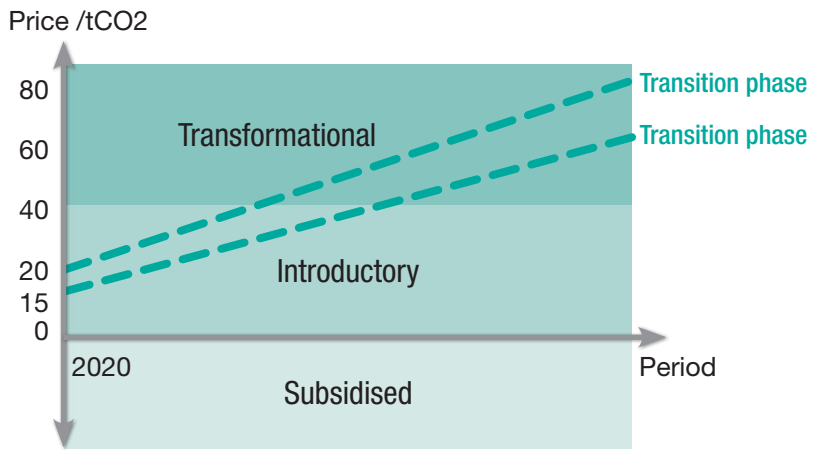
4. List of companies supporting a carbon price through the UN Global Compact and World Bank Initiative: http://wemeanbusinesscoalition.org/content/put-price-carbon

5. Declaration on Business proposals in view of a 2015 international climate change agreement at COP 21 in Paris, May 2015.

6. The Guardian (2015) Europe's energy big six say gas must help in the fight against climate change, 01/06/2015; Press release by Total: http://www.total.com/en/media/news/press-releases/oil-and-gas-majors-call-carbon-pricing

Finally, the introduction of sectoral and geographical flexibility improves the political economy of such a reform. As such, we propose establishing a "carbon corridor" or a "carbon target", independent of the international agreement of the Climate Convention. This "carbon corridor" would be implemented by developed and emerging countries on a voluntary basis, and include a minimum target price of 15 to 20 dollars/ton of CO2 in 2020, and a maximum target price of 60 to 80 dollars/ton of CO2 in 2030/2035.

Figure 19 A carbon price "corridor"



Source : Canfin/Grandjean, after We Mean Business, 2015

This proposition aims to fulfil several objectives:

– Many countries have introduced a carbon price signal without sending a clear message at the international level to economic decision markers. Establishing this voluntary corridor or target would send a common and clear political message, when linked with CoP21. This would send a clear and credible signal on the forwarding looking growth of the price on carbon, which is an essential expectation of economic actors.

– This corridor would aim for a price consistent with levels judged pertinent by studies on the impact of carbon pricing on investment decisions; such as the work by McKinsey, released in 2009[1]. Committing to a minimum carbon price would ensure the improved efficiency of the scheme; a maximum carbon price provides important information to economic actors.

– It combines the strength of a common political message and the necessary flexibility to differentiate between countries and geographical zones, both in terms of price level and time horizon, to better take into account different levels of development.

– It also allows every country or geographical zone to choose the most suitable fiscal or regulatory instrument for its respective context.

– The target price aimed for here is an 'explicit' price signal - translated by a tax or via a cap-and-trade system. Various studies[2] have demonstrated that it would be desirable in the coming decades for this price to reach an amount between 100 to 300 dollars per ton of CO2. In many cases, it appears preferable to complement a lower explicit carbon price (whether through a tax or quotas) with an indirect price signal via norms or standards. The combination of both tools would result de facto in a higher price than the explicit signal alone.

The countries that choose to enact this carbon corridor would commit to ensuring the implementation of these initiatives to create a carbon price signal. The work of the OECD[1] on explicit carbon pricing, conducted to date on 15 countries, as well as the studies of the World Bank, could serve as a relevant base of information and pertinent analysis to monitor commitments.

The decision to create a carbon corridor is likely to be made outside of the formal international climate agreement, given that this process requires international consensus. Governments willing to go further can form a voluntary 'club' that will be able to grow over time. This club could then ensure the reporting of progress on the implementation of these commitments to the Climate Convention.

3.2.2 Redirecting fossil fuels subsidies

Although addressing climate change implies massively reducing dependency on fossil fuels, which are responsible for more than 80% of global CO2 emissions, this sector continues to be heavily supported by both production and consumption subsidies. This continues irrespective of the G20 and the Asian Pacific Economic Cooperation (APEC) establishment in 2009 of a peer-review system of these support or subsidies.

Subsidies to production are even more worrying that those supporting consumption as they incentivize both long-term investments and lock-in into a trajectory incompatible with the objective of keeping global warming below 2°C.

Worldwide, IMF researchers estimate that in 2015 the economic cost – including the negative environmental externalities (climate change, air pollution, etc.) – of after-tax subsidies totaled $ 5.300 trillion – or an economic cost of $10 million per minute – or approximately 6.5% of global GDP. This includes a direct budget cost of about $ 500 billion for national governments. Comparatively, public subsidies for renewable energy have been estimated at approximately $100 billion per year.[2]

In 2013, the OECD identified 700 measures, tax allowances, incentives or other direct funding supporting fossil fuels among the 40 countries studies. According to this analysis, OECD countries provide between $50 to 90 billion of fossil fuel subsidies, with approximately half of subsidies devoted to agriculture potentially harmful for the environment. In France in 2010, these subsidies were essentially dedicated to oil consumption, reaching an amount of $ 2.3 billion out of a total of $2.7 billion (OECD 2013).

The recent decline in oil prices provides an opportunity that can ease the politics of decision-making on this issue. Indeed, the fall in the oil price from 100 to 50 dollars a barrel between June 2014 and the end of March 2015, is equivalent to a negative carbon tax of approximately €100 per ton of CO2 (June 2014 euros). Moreover, this decrease has been used by a number of developing countries such as Indonesia, Malaysia, Morocco and Egypt to phase out public subsidies for fossil fuels, which function in economic terms as a negative price on carbon.

Recent work from the World Bank on the decarbonization of development[3] demonstrates that it is possible to phase out fossil fuel subsidies while at the same time neutralizing the negative effects for the poorest. Furthermore, it has been clearly demonstrated that these subsides go principally to the richest households.

1. OECD (2013) Effective Carbon Pricing Report, Organization for Economic Cooperation and Development.; OECD (2013) Taxing Energy Use, Organization for Economic Cooperation and Development.

2. UNFCCC SCF, 2014.

3. World Bank (2015) Decarbonizing Development.

An initial compensation mechanism consists of reusing the savings from reduced or discontinued subsidies to reduce other taxes. This would therefore redistribute the savings and reduce negative affects while changing the relative price of fossil fuels in a manner coherent with the low-carbon transition. This was, for example, the approach used by Iran in the reform of its subsidies in 2013. A second mechanism would consist of redistributing in kind the savings coming from reduced fossil fuels subsidies. This was the choice made by Ghana, which compensated the reduction of subsidies with the electrification of rural areas, the distribution of more efficient light bulbs, and expanding the health coverage to a broader range of its population.

Progressively redirecting these subsidies can help free up budget capacity to support the 2°C transition within a range of sectors, contribute to the financing of training for employees, or support the low-carbon investments of companies, etc. The redirection of these subsidies does not imply reduced support for households and companies; rather, with a comparable budget, it can accompany the transition towards a decarbonized economy.

We recommend that France support the analysis currently led by the OECD, the IMF and the World Bank on fossil fuel subsidies that are not aligned with decarbonization of the economy. Furthermore, France should support the reduction of any inconsistencies within its own national and broader European public support policies for fossil fuels.

3.3 INTEGRATING THE 2°C SCENARIO IN MACROECONOMIC SCENARIOS AND MODELS

Today, macro-economic forecasting does not generally take climate issues into account[1]. For example, when the IMF analyses future oil prices, the climate challenge is completely absent from their analysis. As for the macro-economic models used by ministries of finance, they are generally not designed to integrate climate-related issues, either in terms of risk to financial stability (particularly due to the absence in these models of dedicated modeling of the financial sector in general), or of the transformation changes needed in the economy. Many macroeconomic models do not depict the interactions between the evolution of natural capital (including energy and climate) and other economic variables such as GDP. Moreover, they do not disaggregate the energy sector, and are therefore not well-adapted to the inclusion of the impacts of the energy transition, whether positive or negative, or of the economic transformations compatible with the 2°C limit. Existing models could be supplemented with tools allowing ad hoc analysis. However, this remains largely unsatisfactory given that feedback loops between GDP, energy and climate, and environmental impacts more generally, can be essential to produce accurate results and are not modeled by classical methodological approaches. It should be noted that the issue of interactions between activity and climate have recently been the subject of discussions at the OECD.[2]

Despite this, countries are increasingly likely to adopt or have adopted the objective of decarbonizing their economies, both in the medium and long term. This commitment is included, for example, in each country's Intended Nationally Determined Contributions

1. The stakes are not the same, depending on whether the models are intended to make economic provision, evaluate public policies, or – according to the time horizon used – projects of a few years to much longer term. This section is aimed primarily at those models used to evaluate public policies or produce medium-term economic forecasts.

2. OCDE, Consequences of Climate Change Damages for Economic Growth, 2014.

(INDCs) (such as those of the United States released in March 2015)[1] but also the joint commitment of President Hollande and the Germany Chancellor made public at the Petersberg Dialogue in May 2015 and in the final G7 Declaration of June 2015.

Yet the macroeconomic models used by international institutions and ministries of finance do not inform political decision-making as to how to guide the decarbonization of the economy. It is important to lend credibility to medium-term decarbonization commitments and integrate them into existing decision-making processes. To do so, it is essential to reconcile price forecasting tools and macroeconomic modeling with this new challenge, which will have implications for all economic.

We make the following proposals:

Before CoP21, finance ministries and international institutions (IMF, OECD, etc.) could commit to integrate a 2°C scenario throughout their macroeconomic forecasts. Thus any scenario on, for example, the evolution of oil prices should indicate whether the assumptions underlying the model are compatible with the 2°C limit.

Also prior to CoP21, a number of states, including France, could commit to incorporating factors related to climate objectives within their macroeconomic forecasting models. As with all modifications to these models, this integration undoubtedly raises methodological issues. These could be productively addressed within the framework of the technical discussions at the IMF or the OECD, relying in particular on the existing academic work on this subject (see box below). In Europe, the European Commission could usefully take the lead on this subject, both in order to modify its own models and to facilitate technical exchanges on this subject with the Member States.

A SELECTION OF ONGOING WORK TO INTEGRATE CLIMATE AND ENERGY DIMENSIONS IN ECONOMIC MODELING

- The work pursued within the Energy Modelling Forum (https://emf.stanford.edu/).
- In France, the Energy and Prosperity Chair (co-chaired by Gaël Giraud and Jean-Pierre Ponssard) is an international academic platform dedicated to economic modeling of the energy transition. It examines in particular the changes in the financial and macroeconomic environments that are necessary for the implementation of public policies and micro-economic and sectoral programs promoting the decarbonization of the economy.
- The work of the OFCE, ADEME and TNO on the Threeme model used in the study of impacts of the draft energy transition and green growth legislation in France (see http://www.ofce.sciences-po.fr/indic&prev/modele.htm).

Kumhof, Michael, and Dirk Muir, October 2012, Oil and the World Economy: Some Possible Futures. Working Paper. 12/256. IMF.

- Oil and the World Economy: Some Possible Futures

Michael Kumhof, Dirk Muir, October 2012, IMF Working Paper No. 12/256.

- Matthew Berg, Brian Hartley and Oliver Richters “A stock-flow consistent input–output model with applications to energy price shocks, interest rates, and heat emissions” 2015 New Journal of Physics 17 015011 (http://iopscience.iop.org/1367-2630/17/1/015011).

1. « Substantial global emission reductions are needed to keep the global temperature rise below 2 degrees Cel-sius, and the 2025 target is consistent with a path to deep decarbonization. This target is consistent with a straight line emission reduction pathway from 2020 to deep, economy-wide emission reductions of 80% or more by 2050. The target is part of a longer range, collective effort to transition to a low-carbon global economy as rapidly as possible. », US INDC, March 2015.

3.4 MOBILIZING ADDITIONAL RESOURCES THROUGH 'INNOVATIVE FINANCING'

3.4.1 The financial transaction tax (FTT)

In 2011 in Cannes, the G20 under the French presidency declared itself in favor of a financial transaction tax (FTT). However, no thorough discussion has since been launched at the international level. The potential revenue generated by a global financial transaction tax has varied depending on the approached used: from $ 50 billion per year according to the Bill Gates report for the G20 in 2011 to $ 300 billion per year[1].

If a global agreement cannot be reached on such a tax, then countries willing to implement it would need to do so in a manner that would not lead to a relocation of financial activity to areas which were tax free. This is at the heart of discussions currently underway within the European Union. The European Commission proposed a draft directive in 2011, however the European Council failed to reach an agreement. Nevertheless, in 2013, eleven EU countries decided to establish an Enhanced Cooperation to introduce an FTT.

In January 2015, the French President spoke in favor of a financial transaction tax based on the "broadest possible base." Following this at the beginning of 2015, the 11 Member States of the resulting Enhanced Cooperation entrusted Austria to preside over the work. Portugal was charged with the coordination of the discussions on the implementation of the FTT. This group has committed to reaching an agreement before the end of 2015. As part of the preparations for CoP21, the pertinent moment to finalize this political agreement sits between June and September. This would allow any progress to be valorized in the discussions on the financial section of the Paris Climate Agreement. Such an agreement would then be translated into a formal draft directive at the EU level by early 2016 at the latest. The other Member States not party to the Enhanced Cooperation would be unable to block this process.

How to avoid the relocation of financial activity?

Avoiding the relocation of financial transaction and activity is not a new concern. It lies at the heart of the technical discussions that are taking place between the 11 Member States of the Enhanced Cooperation. Detailing the various options under discussion is beyond the scope of this report. However it it is useful to specify a number of key principles:

– The application of the 'principle of issuance' ensures that all financial products linked to the jurisdictions of the 11 countries (corporate shares and bonds in particular) will be sufficiently covered by the tax, regardless of the financial actor that performs a transaction.

– The application of the 'residence principle' particularly for derivatives that cannot be traced back to a territorial source (such as interest rate derivatives related to LIBOR[2]) ensures that all stakeholders having their headquarters situated in the area of the 11 Member States are covered by the tax

– Finally the application of the 'beneficiary principle' would permit the identification of the originator of the financial transaction, and thus avoid the undue penalization of financial intermediaries within the covered jurisdiction.

1. Spratt, Stephen, and Christina Ashford (2011) *Climate Finance: A tool kit for assessing climate mitigation and adaptation funding mechanisms.*

2. Libor (London Interbank Offered Rate) is the benchmark rate of a large majority of financial products issued in different currencies in Europe (for the euro we speak of Euribor). It is calculated daily. This is the rate at which banks lend to each other (interbank rate), and the base rate to which margins are applied, on the day in question, to calculate variable loan rates.

Finding the appropriate way of implementing the FTT, in a context where all countries in the world will not be covered, will be a decisive contribution to its further development outside of the Enhanced Cooperation jurisdiction. The leadership that France intends to exercise on this issue can also be a decisive contribution to the future mobilization of financing for climate action globally, particularly in the post-2020 period.

How much must this tax levy to allow France to fulfill its international climate commitments?

This report does not prejudge an agreement between the 11 Member States of the Enhanced Cooperation on the allocation of revenue from the FTT. Given the particularly constrained budgetary context, some members of the Enhanced Cooperation have already publicly stated their intention to use the revenue of the FTT for their general budget. France has repeatedly stated its intention to allocate a significant part to climate finance. Without forgetting the financial needs of other development issues (e.g. the fight against pandemics such as AIDS) this report hypothesizes a 70% allocation by France of the revenues of the discussed "European" FTT for the international fight against climate change.

The current annual revenues of the French FTT, implemented in 2012, total € 700 million.[1] According to the recent work of the World Resources Institute (WRI)[2], new and additional public financing will be needed to fulfill the commitments made at Copenhagen to transfer $ 100 billion per year by 2020. These new and additional financial flows are estimated by WRI at between $ 10 and 15 billion in 2020. Although there is no official formula for distribution between countries of such a collective commitment, this represents around 10% for France or $ 1-1.5 billion by 2020. This is based on France's relative share of Official Development Aid (around 10%); as well as its contribution to the first round of capitalization of the Green Climate Fund (10%). It should be noted in support of this estimate, that Germany committed in June 2015 to allocate € 2 billion of additional public finance in 2020 for international climate finance.

The following table summarizes the financial estimates:

1. French Finance Bill of 2015.

2. WRI (2015) Getting to the $ 100 billion: Climate finance scenarios and projections to 2020.

FINANCIAL TRANSACTION TAX REVENUES AND INTERNATIONAL CLIMATE FINANCE COMMITMENTS

Current annual revenues raised by the French FTT	Minimum estimate of French share of additional funding needed in 2020 to reach '100 billion of Copenhagen'	Estimate of France's share of the additional revenues from the 11-EU FTT (presuming an allocation of 70 % for climate) in 2020	Estimate of total required revenues from the 11-EU FTT	Total revenues from the FTT for France in 2020 (presuming 20 % share of revenues for France)	Possible rhythm of the increase in revenues collected by the 11-EU FTT
$ 700 million	$ 1 billion (or € 900 million, current exchange rate)	€ 1.3 billion	€ 10.5 billion	€ 2 billion	2017: € 5 bn 2018: € 7 bn 2019: € 9 bn 2020: €10,5 bn

The projected € 10.5 billion in 2020 is lower than the estimated revenues for the 11 Member States of the Enhanced Cooperation evaluated by the European Commission at € 35 billion. The objective of $ 10 billion represents a minimum and allows for much flexibility (for example, the ability to exclude transactions relating to sovereign debt). If between 2015 and 2020 an increase in revenues was envisaged through an increase in rates or a broadening of the tax base, for example, then these expected modifications should be explicitly included in the initial decision. This would ensure necessary clarity for stakeholders.

The success of negotiations on the financial transactions tax by the 11 Member States is a key element in the mobilization of additional public climate funding. Furthermore, the success of such a mechanism on this smaller scale could give impetus to the stalled international negotiations on the subject.

FISCAL JUSTICE AND DEVELOPMENT

The mobilization of increased financing in developing countries must not deprive them of that to which they have a right. However, the outflow from developing countries resulting from tax evasion is in many places at least as consequential as inflowing development aid. Therefore it is not possible to separate the development agenda from that of global fiscal justice.
Ongoing discussions on development financing include this dimension.
The progress made in recent years - particularly in the context of the Global Tax Forum, at the request of the G20 – demonstrates that major changes are possible in the fight against tax evasion, offshoring of tax bases and revenue profits, etc. Corporate income tax makes up a larger proportion of the public budget in the developing world than in high-income countries. Thus, the fight against tax evasion by companies is decisive for their fiscal sovereignty and their capacity to finance domestically the necessary investments for development. ■

3.4.2 International transport

Maritime and air transport are large and growing emitters of greenhouse gas emissions. The CO2 emissions from the airline industry are estimated at between 2 and 3% of global emissions, and are expected to grow steadily through 2050, given projected increases in domestic and international traffic[1]. The maritime sector is meanwhile responsible for about 3% of global GHG emissions, and could reach up to 5% of the total in 2050[2]. These sectors face the challenge of improving the efficiency and environmental impact per passenger or ton transported, either through technological improvements or through operational changes such as "slow shipping" or speed reduction in shipping, the impact of which can be significant[3]. However, it is unlikely that these efforts will fully offset the continued growth in emissions due to the expected increases in global trade.

Commitments have been made in both sectors, though with differing levels of ambition. In 2010 the International Civil Aviation Organization (ICAO) adopted a non-binding or "aspirational" goal, aimed at capping emissions from the sector from

1. Lee, D.S., L. L. Lim, and B. Owen(2013) The Impact of the "2020 Carbon Neutral Goal" on Aviation CO2 Radiative Forcing and Temperature Response. Dalton Research Institute, Manchester Metropolitan University; ICAO (2010) Environmental Report 2010 - Aviation and Climate Change. International Civil Aviation Organization.

2. EC. 2013. Time for International Action on CO2 Emissions from Shipping. European Commission Climate Action.

3. According to Transport& Environment, a reduction in speed of 10% could reduce emissions by as much as 27%. http://www.transportenvironment.org/what-we-do/shipping/shipping-and-climate-change

2020 onwards without assigning specific targets to countries or companies.[1] This is combined with a second commitment to improve energy efficiency by 2% per year until 2020, and the stated ambition to continue this same trajectory to 2050. By contrast, the International Maritime Organisation (IMO) has not, to date, adopted any global emissions reduction objectives. At meetings of the IMO in May 2015, the Committee for the Protection of the Marine Environment once again postponed any commitment to "an appropriate future date" by refusing the proposal of the Marshall Islands to cap emissions in the sector[2].

In both sectors, three types of measures are under discussion in relation to climate change: fuel taxation; strengthening environmental efficiency norms and standards; and GHG offsetting to fund CO2 emission reductions.

For aviation, the two measures that are likely to be prioritized in the short term are the introduction of stringent emission norms and standards and the development of a carbon offset system. The taxation of fuels used by aviation is a long-term goal, but requires the modification of both the Chicago Convention and approximately 4,000 bilateral air services agreements. At its 38th Assembly in 2013, the ICAO recognized the need to offset its emissions and paved the way for an offsetting mechanism. It agreed to develop a comprehensive measure to be adopted in 2016 and implemented by 2020[3]. In parallel, new GHG emission efficiency norms and standards (expressed in grams of CO2 per passenger kilometer) for newly certified aircraft are under development for implementation in 2020. It would be desirable that these standards be expanded to cover all new aircraft (including those that have already been certified before this date).

For maritime transport, mitigation action to date has focused on energy efficiency measures adopted by the IMO in 2011. This principally includes the definition of emission efficiency standards for large vessels (over 400 tons) built after 2015 through an energy efficient design index. This binding measure is a step forward, but given the pace of fleet renewal will require between one and two decades before the index applies to all ships[4]. As in the aviation sector, the taxation of maritime bunker fuels is clear long-term objective to pursue. However, this challenge is complicated by the capacity of ships to refuel only a few times a year, and thus select 'accommodating' ports. Finally, without a global emissions cap for the sector, nor inclusion of the maritime sector in an emissions trading system, the development of a compensation mechanism for the sector remains little discussed. Nevertheless, the EU has initiated steps to include the sector in the EU ETS, beginning from 2018, with a measuring and reporting obligation for emissions and efficiency of ships using European Union ports.

Carbon offsetting is increasingly seen as one of the most viable means of achieving emission reductions in these two sectors. The use of carbon offsetting in transport has already created financial flows for GHG reduction projects in developing countries. For example, in 2012 the airline industry was included in the EU ETS and allowed to offset via domestic and international credits. That same year, European airlines used 11 Mt of credits to cover 13% of their emissions with 5.3 Mt of credits from projects in developing countries (Clean Development Mechanism), creating an estimated flow of between € 4 to 22 million[5] to projects in developing countries[6].

Discussions are underway within the ICAO, but it is too early to know what form the offset- or market-mechanism to be proposed by 2016 will take. Preliminary estimates by the ICAO suggest that a mechanism could create a demand for credits

1. Discussions are currently underway within the ICAO in terms of how these commitments will be disaggregated between countries and regions, taking into consideration development levels and other factors.

2. The proposal requested the adoption of a quantified and ambitious emissions reduction target for the maritime transport sector, both in line with the principles of the IMO as well as the overarching 2°C limit of the UNFCCC.

3. If the ICAO is unable to propose a viable mechanism, the European Union has indicated that international aviation will be reintegrated in the EU ETS

4. http://www.transportenvironment.org/what-we-do/shipping/shipping-and-climate-change

5. Estimation of CDC Climat Research: the estimated range is large given the strong fluctuations in carbon credit prices in 2012.

6. It is difficult today to precisely calculate the future demand for offset credits stemming from the inclusion of the aviation sector in the EU ETS. Estimates including international aviation suggest that the sector could have a future need of approxi-mately 382 MtCO2 of credits between 2013-2020 - in addition to their free allocation – for conformity (Alberola Emilie, and Solier Boris (2012) Including International Aviation in the European Union Emissions Trading Scheme : A First Step To-wards a Global Scheme, CDC Climat Research.).Today, EU regulation allows companies to use only 3.8 MtCO2 of interna-tional offsets between 2013 and 2020 given limitations on international credit use.

from 2021 of between $ 2 - 6 billion in 2025, and up to $ 24 billion in 2035. A portion of this demand could be covered by credits from developing countries, depending on the types of credits deemed eligible.[1] The ICAO has estimated that the implementation of a carbon offset mechanism could generate in 2036 an additional cost for passengers of approximately $ 10 per seat for a flight from 10,000 to 12,000 km and $ 1.50 per seat for on a flight between 900 to 1,900 km; this could also lead to reduction of global sector profits of 1.2%.

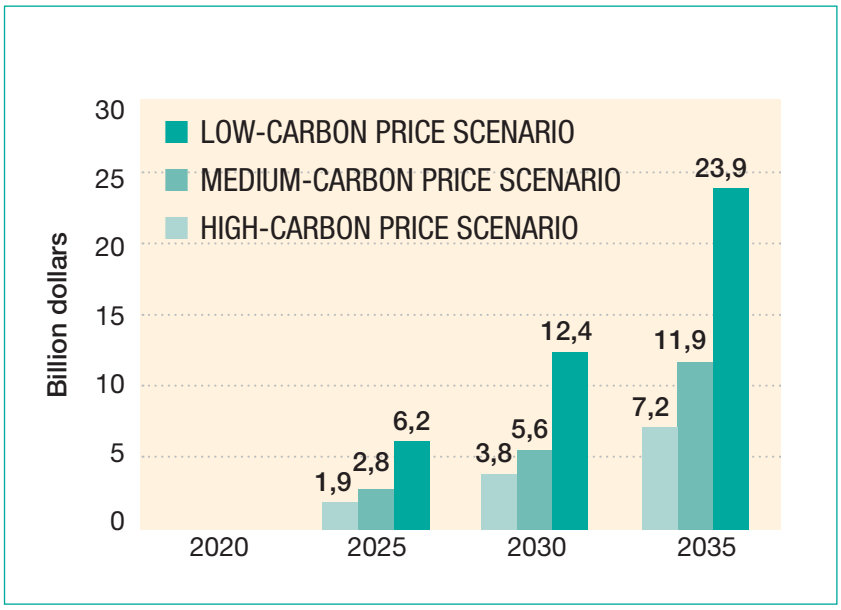


Figure 20 Estimated revenue generated by cost of offsets to reduce CO2 emissions from international aviation (USD billions)

Carbon price scenario	2020	2030	2035
Low ($/ton)	6	10	12
Medium ($/ton)	8	15	20
High ($/ton)	20	33	40

Source : CDC Climat Research after ICAO Environment Advisory Group Meeting (EAG/7), 29-30 October 2014, scenario n°2

The maritime sector could also be a source of funding for projects in developing countries. If the IMO agreed to cap its emissions in 2020, this could create a demand for offset credit ranging from several hundred million tons per year in 2030 to as much as one billion ton a year by 2050 - based on growth and technological improvement scenarios (authors' calculations after IMO 2014)[2].

We thus suggest that France advances the following proposals

For the maritime sector to adopt a carbon-neutral growth target, as has already occurred in the aviation sector, ideally using, at the latest, 2020 emission levels. For the aviation sector we recommend that the proposals currently under consideration regarding norms and standards be ensured to be sufficiently ambitious, and are applied to the entire fleet of new aircraft as quickly as possible.

In parallel, we recommend that carbon offset mechanism - committed in 2010 by the IACO - be implemented as soon as possible. This is in order to support projects with both mitigation and adaptation co-benefits in the Least Developed Countries, the Small Island Developing States and Africa. The financial flows to support climate-related projects in these countries are currently limited. Prioritizing projects from these countries within the ICAO's carbon offset mechanism could ensure a maximum leverage in terms of the additionality of impact. For example, mobilizing between $ 2-6 billion could fund the restoration of the 12 million hectares of arable land degraded each year. This would allow the aviation sector to honor its commitment while making a decisive contribution to both the fight against climate change and food security, without threatening the competitiveness of the sector. Furthermore, this commitment would revive the international carbon

1.Authors calculations after IMO (2014) Third IMO Greenhouse Gas Study 2014, International Maritime Organization. .

2. ICAO (2013) Report of the Assessment of Market-Based Measures, International Civil Aviation Organization.

crediting mechanisms, building on lessons learned from experience since 2006. Thus could be established a price floor of $ 5 to 7 per ton CO2eq. (increasing over time), to ensure the minimum level of price visibility required for both offset project developers and companies subject to mandatory carbon offsetting.

Given the increasing engagement of companies in the run-up to CoP21, we believe that it would be particularly appropriate for the aviation sector disclose and commit in 2015 to a set broad principles concerning how it intends to implement the commitment made in 2010; even if detailed modalities are agreed to in 2016. France could, with other countries, contribute to this process.

3.4.3 Carbon market revenues

To date, carbon pricing mechanisms have not achieved the potential revenue streams for international climate finance estimated at the beginning of the decade. Given the experience of recent years, only carbon market auction revenue appears to offer an opportunity to generate international flows in the short to medium term. Nevertheless, most of the revenues from carbon market auctions have been to date earmarked for domestic purposes, such as financing emission reduction policies as well as reducing social system charges. In the EU ETS, of the € 3.6 billion generated by auctioning in 2013, Member States reported using € 3 billion for climate–related purposes. Of this a minor part was used for international climate finance (0.5 billion €, principally in Germany through the "Sondervermögen Energie und Klimafonds" and the UK).

With the expansion of carbon markets worldwide, it is likely that these systems will be an increasing source of revenue for governments. In the case of the EU ETS, auction revenues are estimated between € 230 to 320 billion between 2015 and 2030, given the increased share of allowances auctioned (CDC Climat Research estimates). If Member States in the future dedicated an average of 70% of auction revenue to the climate, and of that about a third to international climate finance, this could create a flows of between € 56 and 79 billion over the period, or €3.5 to 5 billion per year to finance projects in developing countries. This would represent approximately 25% of all auction revenues, compared to the 15% observed in 2013.

ESTIMATED ALLOCATION OF EU ET AUCTION REVENUES 2015-2030 ♦ (PRICE OF ALLOWANCE INCREASING BETWEEN 9-34 €)

	Total 2015-2030 (in Bn€)	% Used for climate *	Of which for international action **	Total for international climate action (in Bn€) 2015-2030
Low-revenue scenario	228	69%	36%	**56 (25% du total)**
High-revenue scenario	321	69%	36%	**79 (25% du total)**

♦ The variation between the low and high scenario depends on the date of implementation (2021 compared to 2019) of the "market stability reserve" with an impact on the excess of allowances in the market and on the increase in allowance price between 2015-2030.

* In EU 15 countries, an assumption of 75% was used; in Central and Eastern European countries, 50%.

** In the EU15 countries, an assumption of 42% was used; in Central and Eastern European countries, 10%.

Source : CDC Climat Research

The creation of a financial flow for international climate action is dependent on the sovereign choices of the Member States. Nevertheless as proposed - but refused - in 2008, common principles for the use of auction revenues could be developed: France should support a recommendation at the European level that 25% of the total of EU ETS auction revenues be used to finance climate projects in developing countries.

Figure 21 Summary table of potential revenues from selected market mechanisms

	Year	Range of Funds Raised for International Climate Finance
Aviation Carbon Offsetting Mechanism [1]	2025 2030 2035	$ 1.9 – 6.2 billion $ 3.8 – 12.4 billion $ 7.2 – 23.9 billion
Carbon Market Auction Revenues (EU ETS) [2]	2015-2030 (average)	€ 3.2-5 billion

3.5 INCREASING THE LEVERAGE OF PUBLIC RESOURCES

3.5.1 The key role of development banks

Development banks can be classified according to their shareholders. Multilateral Development Banks (MDBs) are those with more than one country as a shareholders. Some have regional, rather than international shareholders.[3] Development banks with a single Nation State as shareholder are referred to as bilateral/national development banks (i.e. the Agence Française de Développement (AFD) in France, or Banco Nacional De Desenvolvimento Econômico e Social (BNDES) in Brazil). The European Investment Bank (EIB) constitutes a particular case and is considered here as a MDB.[4]

Another distinction is made between:

– Development Financial Institutions (DFIs), whose mandate is to finance development projects in developing countries, and

– National and Regional Development Banks (NDBs), whose main mandate is to finance projects in their own country or region.

The International Development Finance Club (IDFC) regroups 19 institutions – among which bilateral, multilateral, regional and national development finance institutions are included.

Many Multilateral Development Banks have developed extensive experience and expertise on climate finance. According to the Joint Report on MDB Climate Finance in 2013, MDBs financed $ 23 billion in climate activities, or approximately 18% of their total financial operations. Of this, $ 7 billion came from the World Bank Group. These figures compare with those of national development banks provided financed $ 69 billion in climate projects in 2013.[5]

1. Preliminary estimates by ICAO suggest that a mechanism could create a demand for credits from 2021 of between $ 2 - 6 billion in 2025 - up to $ 24 billion in 2035. Of this, a portion of this demand could be covered by credits from developing countries depending on the types of credits deemed eligible. ICAO 2015.

2. If Member States in the future dedicated an average of 70% of auction revenue to the climate, and of that about a third to international climate finance, this could create a flow of between € 56 and 79 billion over the period, or €3.5 to 5 billion per year to finance projects in developing countries.

3. Included in this category are the World Bank (IBRD+ IDA), the IFC, the AfDB, the AsDB, the IABD, the EBRD, the IsDB, the CAF, the CBIE, the AIIB, and the regional banks of the CFA Franc Zone (BOAD and BOAC).

4. For operations outside the EU, the EIB can be considered as a bilateral bank, with the EU as its single shareholder.

5. CPI, 2013.

Nevertheless, as highlighted by the NCE report (2015), Multilateral Development Banks have an important role to play in increasing the financing of green infrastructure in developing countries.

First, MDBs can ease the constraint of convertibility or transfer risk. Massive financial flows are expected from institutional investors in high-income countries to support low-carbon investment in developing countries. This will require, however, that a large portion of the convertibility risk be covered. Currently, only MDBs are able to do so thanks to their Preferred Creditor Status (see Box 8). Secondly, as recommended by NCE and the Climate Investment Funds,.[5] they can scale up the use of debt de-risking instruments for co-financers in project structuration. For instance, they could take subordinated debt tranches in their non-concessional lending, or guarantee project first-losses. Through these policies, MDBs can help reduce the overall cost of finance for projects and increase their 'bankability.'

SUBORDINATED DEBT

A debt is said to be subordinated when the repayment of the interest and/or principal occurs after the repayment of the 'senior' debt tranche(s). If the project does not generate enough cash flow to repay the total debt amount due in a given year, subordinated debt amounts are capitalized. The capitalized amounts do not become due until the final maturity date of the subordinated debt, generally 8 years. This period of time allows the project to complete construction and initial operational phases and reach a stable level of cash flow.

The inclusion of a subordinated debt tranche in the financial package of a project significantly reduces the cost of senior debt. The global cost of the project can thus be lowered. Through reducing risk related to the repayment of senior debt, a subordinated debt tranche could improve the rating of the overall project finance, categorizing it as 'investment grade' and thus improving its attractiveness to institutional investors. ■

FIRST-LOSS GUARANTEE

First-loss guarantees differ from subordinated debt, but have a similar objective. Through this instrument, a financial institution commits to compensate project losses during the initial project phases, as compared to the estimated future cash flows of the project. This covers the risk of delays in construction and initial operational phases that may threaten the reimbursement of lenders. ■

1. Vivid Economics, June2014 ; UNEP FI 2011.

Development banks could also increase their use of programmatic approaches, thus facilitating access to financing for smaller-scale low-carbon projects in developing countries. Programmatic approaches, launched jointly between local government and a development banks can have the following advantages by: improving project visibility; reducing development costs by sharing and standardizing; improving investor confidence concerning the reliability of the regulatory environment of the project; and contributing to the creation of a regulatory environment that is aligned with a low-carbon development model. See Box below for an example from the South African ERI4P program.

Such programmatic approaches could be extended to leverage local banking networks for the short-term needs of green projects through credit lines. In developing countries, the local banking sector is usually less developed. Nevertheless, these networks can provide the working capital needed for small-scale projects (for example, individual solar lamps). The Climate Investment Funds already uses this programmatic approach for smaller projects; the and the Private Sector Facility of the Green Investment Fund has announced its intention to use this approach. We believe that the expansion of programmatic approaches would be a step in the right direction.

SOUTH AFRICA'S RENEWABLE ENERGY INDEPENDENT POWER PRODUCERS PROCUREMENT PROGRAM (REI4P)

The benefits of a programmatic approach to increase access to finance is demonstrated by the Renewable Energy Independent Power Producers Procurement Program (REI4P) in South Africa.
The Government's commitment to offer power purchase agreements for 3.7 GW of renewables capacity, over three rounds, to developers offering the lowers price led to $ 5.7 billion of investment in 2012, from almost nothing previously. The local Standard Bank developed significant expertise in the area and is committing 15.5 billion Rand to the first two rounds making it the 7th largest arranger of clean energy asset finance in 2012. ■

Source : BNEF, 2013

INCREASING THE IMPACT OF PUBLIC FUNDS THROUGH FINANCIAL INNOVATION

Beyond the main tools analyzed so far in the present report, multiple initiatives and current discussion aim to increase the leverage of public funds towards maximizing its impact on populations and the climate. For instance, the Global Innovation Lab[1], an international initiative aims to identify, structure and monitor a new generation of financial instruments to enhance climate action. The G7 countries announced in June 2015 the interest of basing efforts on their work, among that of others, to accelerate the access to clean energy in Africa. Results-based payment mechanisms, such as Climate Impact Bonds, allow public authorities to finance or 'purchase' the reduction in negative externalities (such as GHG emissions) from private sector actors on the basis of pre-agreed targets.

These emerging mechanisms are promising insofar as they align the interest of public and private sector actors. They optimize public spending, which effectively occurs only if private actors reach their objectives. Furthermore, strong potential lies in better articulating development banks and NGOs, which can facilitate the financing of small-scale climate projects among the poorest, in rural areas, in informal settlements in large cities, etc. In practice, development banks are not adapted to the direct financing of very small projects. Thus, partnerships between these institutions and for instance, microfinance lenders, could be further developed. Small projects currently do not have access to the traditional financing instruments offered by development banks due to high minimum size thresholds. A solution for this could be to foster the 'pooling' of projects under a single holding structure that could in turn contract financing with a development bank. ■

For further information:

Emmanuel Faber and Jay Naiddo, *Innover par la mobiisation des acteurs : 10 propositions pour une nouvelle approche de l'aide au développement,* 2014

1. http://climatefinancelab.org

Beyond development banks, the Green Climate Fund acts as a donor for regional or local financial intermediaries. It can bring the necessary additional resources and use the risk sharing instruments discussed above to leverage domestic private finance, described below.

In addition to the financial instruments to reduce risks for their co-financers, Public development banks can play a key role in terms of labeling green and low-carbon projects and disseminating good practices in terms of capital allocation.

The World Bank is particularly active in this area. It has begun to act as a project originator, structuring projects and leveraging private finance without the direct inclusion of the individual projects in its own balance sheet. This allows the World Bank to expand its role as 'development project' developer, without exceeding its own financing capacity.

In conclusion, Climate finance, including projects with climate co-benefits, represents 15% to 20% of development banks commitments today.[1] France's development bank AFD is a frontrunner in expanding beyond this average. It currently has the formal target of allocating 50% share financing to projects with climate co-benefits.

We propose the following recommendations:

– Each development bank should develop a '2°C investment roadmap' and demonstrate its contribution to keeping climate change below the 2°C ceiling as well as the carbon content and resilience of its portfolio of funded projects – and its procedures to integrate resiliency across its activities.

– Each development bank increases its share of funding towards low-carbon investment or to projects with climate co-benefits climates.

– The MDBs and the members of the IDFC work together to offer, possibly in connection with the Green Climate Fund, a set of common practices concerning the labeling of green projects, enabling the monitoring of the above-mentioned portfolio allocation objective. This should also be done to develop a method to certify the resiliency of the projects financed.

– Development banks should increase the use of innovative structuring tools for climate-related projects, such subordinated debt or first-loss guarantee, that reduce the risk perceived by the co-financiers. This will help decrease the overall cost of finance the project. This implies that institution shareholders define a dedicated strategy and allocate the necessary human resources for implementation.

– Development banks should support, when appropriate, programmatic approaches for financing low-carbon development, particularly to support small projects.

– Development banks should integrate into any infrastructure they finance resilience and adaptation to climate change as requested by the G7 in June 2015[2]. Furthermore, development banks also have a role in developing robust methodologies to take into consideration adaptation and resiliency that can could be used by private investors.

These recommendations can lead to both increased engagement and calculated risk taking by development banks, and therefore raises questions concerning the adequacy of their capitalization to do so. This will be explored in the following section.

1. Data communicated by the AFD.

2. 'We pledge to incorporate climate mitigation and resilience considerations into our development assistance and investment decisions," G7, Declaration of June 2015

3.5.2 Preventing future capital constraints for development banks

Today, development banks do not appear to be limited by capital constraints. For example, the risk capital utilization rate of the African Development Bank (AfDB) reached 61% at the end of 2014 (compared to 62% at the end of 2013 with a statutory limit of 100%). Its equity to loan ratio attained 52% in the same year (compared to 48% with a statutory limit of 100%). This under-utilization for the AfDB is due to several factors, including the difficulty of finding projects in creditworthy countries and the high geographic concentration of institutions (for example, North African countries have further projects to submit, however the Bank has reached its prudential cap on exposure for these countries). Other MDBs equally have existing additional headroom as seen in Table 4.

Figure 22 Capital use ratios of Multilateral Development Banks in 2014

MDB	LIMIT	PERCENTAGE IN FISCAL YEAR 2014
Risk Capital Utilization Rate		
AfDB	<100%	61,2%
ADB	(non)	64,4%
IBRD	(non)	69,7%
EBRD	<90%	73%
IADB	<72%	76,9%
IFC	<90%	81%
Equity to Loan Ratio		
AfDB	(non)	48%
ADB	>25%	32,1%
IBRD	>20%	24,9%
EBRD	(non)	49,8%
IADB	(non)	33,7%
IFC	(non)	89%
Borrowing limit (as a percentage of subscribed capital)		
BAfD	<100%	39,1%
BAsD	<100%	51%
BIRD	<100%	58%
BERD	<100%	81%
BID	<100%	66,2%
SFI	<100%	55%

Source : Joint report on MDB Climate Finance, 2013.

We therefore support the idea of 'country risk exposure swaps' forwarded notably by France at the end of 2013, and since implemented by the World Bank Group. The use of this instrument between MDBs would allow the diversification and mitigation of country risks, and an increase in additional capacity for investment in countries (e.g. North Africa for AfDB).

Additionally, reforms have been launched or are under discussion in some MDBs. These include: the ongoing merger between ADB-ADF (Asian Development

Bank - Asian Development Fund) that will increase the resulting institution's financial capacity; within the World Bank, the proposed reform of IDA (International Development Association) to increase its leverage effect; and discussion to support a 'Green Transition' at the European Bank for Reconstruction and Development. Excluding the last, these reforms should provide budgetary headroom to increase climate finance.

The share of development banks activities that support the transition is limited. If development banks massively increase the volume and relative percentage of intervention in this area (given the significant financing needs) and increase risk taking, it would probably be necessary for at least the MDBs to increase their financial capacity, in accordance with their capital model. For the AFD, which is a specific case, the approach would be different (see box below).

In the business model of MDBs, a significant amount of callable, but non paid-in, capital co-exists with paid-in capital. This choice first allows for a sufficient level of equity while at the same time limiting the cost for shareholder countries; secondly, it further guaranties an institution's solvency. Thus, Standard and Poor's assigns two ratings to these institutions: a 'stand-alone' rating (without taking callable capital into consideration) and a final 'issuer credit rating,' that takes into consideration the theoretical possibility of an additional call in case of crisis. Thus, in 2014 the AfDB was rated at AA in stand-alone, but remained AAA in issuer credit rating. This callable capital serves as a last resort recourse after the exhaustion of all possible alternatives in the event of major financial shocks.

In the case of future capital needs, development banks will likely need to increase their callable capital. This, however, will not necessarily result in a rise in the public deficit or public debt for those Governments involved. Rather, the extension of an implicit guarantee (see Box 15), followed by the called capital if needed. Given that capital increases are generally complex to negotiate, it is important to prepare well in advance. Given that negotiating a capital increase, whether callable or paid-in, is complex, it is important that preparations are made well in advance.

HOW ARE NATIONAL COMMITMENTS VIS-À-VIS PUBLIC BANKS REGISTERED IN PUBLIC ACCOUNTS?

Contrary to popular arguments, lending by public banks such as the Agence Française de Développement or the World Bank are not recorded as public debt in Europe as per Maastrichtian accountancy requirements. EU Member States may, however, be either explicitly committed - through direct guarantees on a loan or an overall guarantee on the bank's operations - or implicitly - through the financial operations of private and public banks. For European countries, the accounting for these commitments follow precise rules, defined and monitored by Eurostat.

Broadly speaking , there are three types of commitments with different impacts on public accounts.

1. Capitalization and lending

The country has a commitment to a bank when it decided to subscribe directly to the capital of the latter. This commitment takes the form of an equity stake in the public bank (listed in country's national accounts. This commitment includes, in addition to the paid-in share, a non-paid-in share.

When the non paid-in share is 'called' by the bank, the country must fund this commitment. The required funding may come either from an asset sale, from a tax increase (all other things being equal) or from an increase in the public debt. This is also the case when a Government assumes the liabilities of a private or public bank in default, as some Governments did during the 2008 crisis. This is also the case when the Government lends to a public or private bank, as demonstrated by the French Government's actions at the end of 2008. But, in this case, it can hope to recuperate part or all of the lent sum – as well as any accumulated interest.

2. Guarantees

A Government may not directly provide capital or financing, but rather provide a guarantee to cover one or part of a given bank's operations, or even its entire balance sheet This guarantee is not included in the public debt. However, explicit guarantees such as the one granted to AFD by the French Government are consolidated into the public debt under Maastrichtian accounting rules. The public deficit is impact-ed only when the Government must actually pay on a 'called' guarantee[1]. Nevertheless, these guarantees are traced in an appendix of the country's national accounts. Rating agencies take guarantees granted by a Government into account in the rating of sovereign bonds, as well as the probability that the guarantee might be called.

3. Off balance sheet commitments without explicit guarantees

The public debt is not affected when Governments contribute to the capital of a public bank, but this capital is not called (for example the participation of the French State in the capital of the World Bank). However, given that the non paid-in subscribed capital of MDBs is callable at first request, third parties consider that in case of default the respective Government will pay-in this the corresponding amount. This is known as an "off balance sheet" commitment, not recorded in the public debt accounting of the Government; they nevertheless are traced in an annex of the country's national accounts (as off balance sheet commitments).

This is also the case of loans and other liabilities of public banks. If they fail, the bank's creditors would turn to shareholders to recover the amount of debt owed, beyond the capital alone. ■

1. INSEE (2015) Complément d'information rapide n°73, 26 March: "Loans to foreign States by the French Development Agency (AFD) and under the guarantee of the French State are now included in the assets and liabilities of the State in national accounts. This treatment has an effect of € 3.0 billion on the Maastricht debt at the end of 2014, it has no effect on net debt." (Translated by authors)

THE CASE OF AFD

AFD is subject to the "Basel 3" prudential regulation, and is not part of institutions exempted from the new CRD4 / RRC regulations. AFD's balance sheet grew 7% per year on average between 2005 and 2014, or doubled over 10 years. It should continue to grow and thus progress from € 30.6 billion at the end of 2014 to € 50 billion in 2025. The level of annual activity of AFD will stabilize due to the implementation of Basel 3[1]. As an order of magnitude estimate, AFD's activities are expected to total, including all loans, € 8.5 billion. According to our estimations, if aligned with the prudential frameworks used by other development banks (such as Basel 2), the AFD could increase its activity by € 1 to 2 billion or an increase of close to 25%.[2] Concretely, we propose two options: (1) either to submit to the European supervisor (ECB) an internal model – as done by the largest private banks; (2) to define a new set of adapted prudential rules determined by the Government and applicable to AFD. In any case, AFD's rigorous management practices, and its strong governance, limit the taking of unreasonable risks. We recommend the establishment of an inter-ministerial working group to develop a concrete proposal before CoP21 for implementation in 2016. This would allow France to rapidly increase the mobilization of public funds by 2020, with little to no direct impact on the public deficit or public debt. ■

3.5.3 Improved coverage of political risks for low-carbon projects

Political instability is one of the leading risks cited by investors to finance climate-related projects in developing countries (even if these risks do not directly stem from climate-related issues). Indeed the political systems of many developing countries are considered 'fragile' by investors. It is important to further note that 'climatic instability' will exacerbate geopolitical instability due to increased conflicts around the access to resources and resulting internal migrations. This is why the US State Department qualifies climate change as a "threat multiplier".

This kind of vicious circle further strengthens the need to invest now in the transition to a low-carbon and resilient economy in developing countries. The concern of investors over political risks is reinforced by the long-term nature of the needed investments. Finally, these investments often occur in areas where the government intervenes not only as a guarantor of the overall political stability, but also as a contractual environmental regulator of the project (e.g. feed-in tariffs) and often as a direct project participant (e.g. the production and distribution of electricity) or via public private partnerships.

MIGA (Multilateral Insurance and Guarantee Agency), the insurance subsidiary of the World Bank Group, identify political risks - primarily the risk of adverse changes in regulatory environment – which are the second most important factor blocking foreign direct investments, after macroeconomic instability. Furthermore, 41% of investors surveyed by Vivid Economics declared having abandoned investment

1. This is particularly due to increased requirements relative share Tier 1 capital. Not all capital made available to AFD by the French Government fall into this Tier 1 category. Thus because of the distinction that now needs to be made between the various equity funding categories, the capacity of AFD to intervene in country where it is close to its exposure ceilings is limited.

2. Based on estimates provided by Carbone4.

projects in that year for this reason. These risks are particularly pronounced in low-carbon area.[1]

The financial instruments currently in place to cover this risk are:

– Coverage of political risk by MIGA.

– The World Bank's partial risk guarantee (PRG) covers private lenders against credit defaults when this result from the default of national government of the host-country on one of its obligations.

– Overseas private Investment Corporation (OPIC) – a subsidiary of USAID, provides political risk coverage similar to MIGA, but specifically dedicated to American companies. OPIC prioritizes climate and low-carbon projects.

MIGA currently guarantees an annual volume of $ 3.2 billion, allowing the mobilization of $ 6-8 billion of funding for public and private projects. Of this, 20 -50% is dedicated to climate finance, depending on the definition used. Its modes of intervention are:

– Coverage of convertibility risk on loans and capital: in case of currency convertibility, MIGA takes the project's place in interacting with investors in foreign currencies; and if necessary procures local currency directly from the host country (it has preferred creditor status).

– War and civil unrest: MIGA pays what is due to the financers if the project becomes un-exploitable (physical access to the project is cut off, for example).

– Government not honoring commitments; e.g. within the framework of a power-purchase agreement: MIGA makes the payment in lieu of the Government.

– Expropriation: compensation from MIGA for the full costs incurred when expropriation occurs.

– A guarantee to reduce the cost of risk: MIGA guarantees a Government's commitments. An involved bank's loan is not weighted in the application of the Basel 3 prudential regulations, freeing up equity for further operations.

MIGA easily reinsures itself with major private reinsurers given its low default rate. Indeed, MIGA benefits from being part of the World Bank group: as host countries wish to maintain an overall good relationship with the Group, projects continue to operate even in case of serious political unrest. Thus of 700 projects financed by MIGA since its inception, only two have called their guarantee. MIGA may also intervene in association with the Partial Risk Guarantee program of the World Bank, which further reduces the risk for investors.

MIGA is thus a powerful catalyst for leveraging private finance to support both private and public projects. It is likely to significantly reduce the cost of financing and thus make the projects "bankable" (see Box 15).

The role that MIGA plays to support projects in the global South constitutes a risk-taking by the global North. This guarantee serves to attract capital to projects in the developing world and thus can be counted as a public North / South flow.

1. Vivid Economics, 2014.

We propose that MIGA significantly increase its volume of intervention on projects aligned with a 2°C development model. This should occur in conjunction with the strengthening of action from the World Bank Group in a coordinated and integrated fashion. To leverage private finance quickly, it would be desirable for the World Bank Group's shareholders to forward an ambitious strategy with the objective to rapidly multiply the volumes provided for low-carbon development.

It could also be of interest to consider the establishment of a specialized credit enhancement instrument for transition-related projects or 'green monoliner.' It would allow the debt of these projects to benefit from the highest possible rating from rating agencies. This would, in turn, facilitate the investment of institutional investors in these projects. In France, the Ariz guarantee mechanism developed by the AFD to support small businesses, could be further expanded.

3.5.4 Using the IMF's Special Drawing Rights for climate action?

In April 2009 the G20 authorized the IMF to issue new Special Drawing Rights (SDRs) amounting to 161 billion SDR[1] to help major economies overcome the liquidity crisis that threatened their interbank markets. Indeed, one of the principal objectives of IMF is to ensure financial stability. As such, it is worth investigating the use of SDRs, particularly in a context where climate change is increasingly recognized as a major threat to this stability. Specifically what are the benefits, the consequences and difficulties? Could there be a donation or lending of SDRs?

A few reminders

SDRs are an option (a 'right') available in four currencies: the euro, the US dollar, the yen and the sterling. Governments that are members of the IMF are allocated SDRs free of charge. The SDR is an asset or in reality a currency option, registered in the amount of the country's foreign exchange reserves. This allocation is accompanied with an equal debt vis-à-vis the IMF, which is registered in the balance sheet of the central bank of the country concerned.[2]

The debt is accounted - following 'Maastricht' rules for European countries - as a debt to the rest of the world. If one gives or lends a SDR, it comes out of the book value but remains a liability. It is the Government that holds the SDRs. The decision to loan or give SDRs is therefore up to the Government as the central bank having only a role of account holder. However, it is the central bank that bears the associated currency risk; if the relative value of the SDR is weakened, the Central Bank will have to acknowledge the loss.

It is important to note the fact that the IMF disposes the power to create SDRs ex nihilo. Thus, the SDRs allocated in 2009 to all IMF member countries are not an immediate counterparty to labor, products or market services, unlike the classic exchange reserves, which are obtained in exchange for a sale in the real economy.

Once a Government elects to exercise its option, it can transfer all or part of its SDRs to a third party (another Member State of the IMF or an eligible financial institution)[3] in exchange for currency. Its foreign exchange reserves are thus modified, as the currency replaces the SDRs[4]. This mechanism enables a Government to acquire

1. On 30 April 2014, an SDR was valued at $ 1.55. Over the successive allocations from the IMF, 204 billion SDRs have been created, the equivalent of € 316 billion euros. France, for example held at 3à April 2014 9,287,000 SDRs equivalent to $ 14.4 billion.

2. This debt vis-à-vis the IMF has an undetermined tenor and in practice will never be reimbursed.

3. Most multilateral development banks are authorized to hold SDRs.

4. The Government must pay to the IMF interest calculated on the difference between the SDR allocation of the country and the amount actually held. The rate is a weighted average of the short interest rates of central banks and associated with the four currencies (currently 0.9%).

foreign reserves in a given currency, whereas borrowing the equivalent sum from international currency markets would cost more than the rate demanded by the IMF.

Granting SDRs?

SDRs cannot be granted to entities that have not been approved to hold SDRs by the IMF. For example, the Green Climate Fund is not currently an approved holder[1]. It might be possible to launch the necessary procedures for its accreditation. It is also foreseeable to donate SDRs to an authorized multilateral development bank. An MDB could then convert the SDRs to freely convertible currencies to lend or to increase additional leverage on capital markets, given that its resources would have been increased. This donation could be accompanied by a political, rather than legal, commitment to pursue more low-carbon, climate-resilient projects.

Granting SDRs, however, poses several problems. It causes a de facto decrease in foreign exchange reserves of the donor country. Replenishing foreign exchange reserves could be financed through the creation of local currency by the central bank of a value equivalent to the SDRs donated. This option would probably be highly debated and most likely prohibited in the case of national central banks part of the Eurosystem where it is considered as assimilated to monetary financing. If the reduction of foreign exchange reserves were fully offset by the Government, there would be little advantage to using SDRs in this fashion.

Lending SDRs?

Given that granting SDRs appears to be challenging, the long-term lending without interest could be considered. This is based on the precedent in 2009 where a loan of 1.328 billion SDRs was used to finance the IMFs Poverty Reduction and Growth Facility (PRGF). For instance, France could use a small portion of its SDR as a long-term no-interest loan to the Green Climat Fund or another dedicated fund structure. If not eligible today to receive a grant, the GCF is eligible for receiving loans of SDRs..During the lending period, the Banque de France would formally commit to provide SDRs or currencies (euros or dollars) to the fund with an agreement under which the Banque de France would immediately and bilaterally convert SDRs into currency. This loan would nevertheless incur a debt owed to the Banque de France by the GCF. This debt would be included in the Banque de France's the accounts receivable portion of its balance sheet to account for the temporary reduction of its reserves (in SDRs or currencies). It will likely be necessary to check whether the formal agreement of the IMF board is required for such an operation.

In conclusion, the use of SDRs allocated in 2009 has the major advantage of incurring no impact on the deficit or public debt of the country concerned. On the other hand, it is useful to remember that SDRs were allocated to countries at a lesser cost than what normal currency reserves would cost (obtained in exchange for export of property or service). This technical analysis justifies the value of pursuing discussions on the possible use of SDRs to mobilize additional climate finance. Given the importance of climate change, no tool should not be ruled out for reasons of principle only – particularly when a first technical analysis demonstrates potential.

We propose that France entrusts further analysis of this subject to a qualified pluralistic panel of financial experts, whose objective would be to present concrete proposals prior to CoP21.

1. The accreditation would require an agreement by 85% of the IMF Executive Board. The ensemble of the Green Climate Fund's board members would have to approve accreditation.

3.5.5 Supporting the development of low-carbon, climate-resilient projects

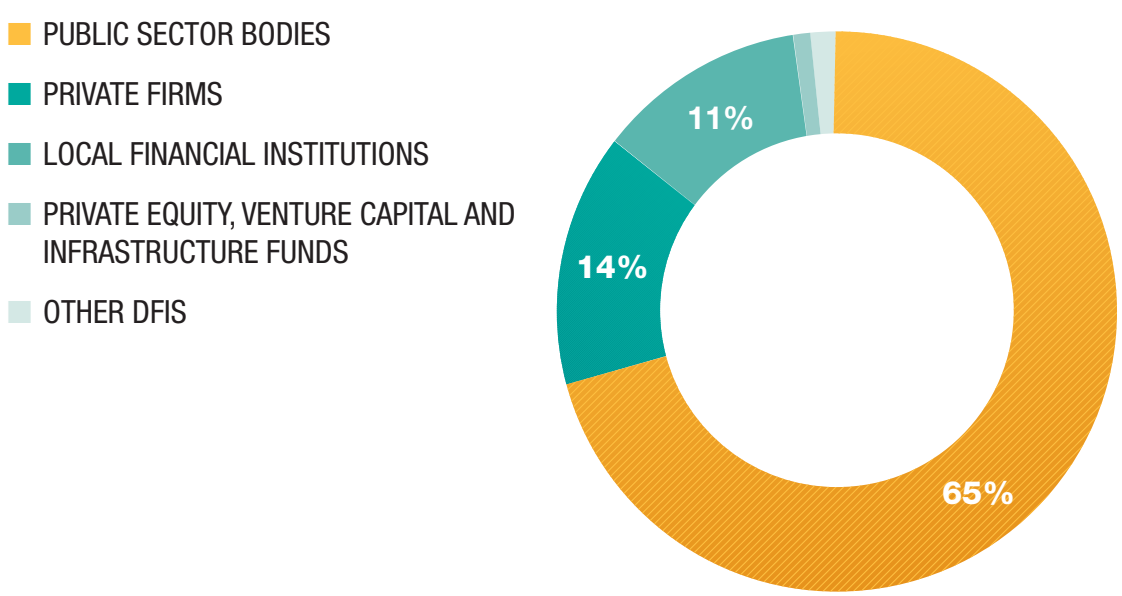
The lack of projects is often presented as the main obstacle to the transition to a low-carbon development model. In fact, this widely shared diagnosis[1] is linked to the broader lack of project-development capacity in developing countries, particularly in LDCs. Low-carbon specifications are still poorly integrated into the terms of reference of projects in the development phase (also true in the global North), and are often seen, sometimes in error, as an un-funded short-term additional cost, even if it generates medium- and long-term savings. Project developers do not necessarily have the skills needed to develop low-carbon projects in the global South. This is also valid for Governments with an impact on the quality of the dialogue necessary to build a contractual framework conducive to establishing bankable low-carbon projects. This lack of bankable projects is particularly evident in Africa. The public finance from high-income economies can play an important role, at a relatively low cost, to catalyze the development of a "pipeline" of green projects in the South.

Development banks are important sources of technical assistance and capacity support, directly or through funds allocated for project preparations. These funds can help project developers, but also the Government in recipient countries, to prepare low-carbon projects that align with national strategies (e.g. GIZ / KfW program, Public Private Partnerships Advisory Fund PPPIAF of the Bank World, the UNEP Africa Carbon Asset Development program).

As shown in Figure 23, development banks are involved in only a limited fashion through investment funds that channeling equity and risk capital to support the capital investments in projects under development.

1. NCE,2015.

Figure 23 Two thirds of the financial support from development finance institutions is allocated to public sector organizations



Source : Vivid Economics, 2014

Development banks could increase support to actors that play a key role in the emergence of private projects. Export credit agencies could also play a role by supporting private equity funds for the development and the initial investment in private low-carbon projects in developing countries. These two types of institutions have relatively less-expensive expertise to offer compared to the private sector, which could reduce the initial costs for developing countries. They also dispose of operational and regulatory leverage to accelerate negotiations with local partners to set up projects. The Green Climate Fund could also develop technical assistance programs to assist with the implementation and development of projects, and / or capital investment in development funds, in conjunction with the local partners that it sponsors.

Finally, the low-carbon transition requires the exploration of new industrial processes and techniques to scale-up low-carbon energy production, some of which are not yet at a commercial-grade stage (carbon capture and storage, hydrogen mobility, etc.). Subsidies and public guarantees from developed countries are necessary, in connection with, the wide-spread adoption of a carbon price, to accelerate the availability of these technologies in both Northern and Southern countries and to accelerate the scale-change necessary for their deployment.

1. In low-income countries when no other viable alternatives are available.

EXPORT CREDIT AGENCIES AND CLIMATE CHANGE

Export Credit Agencies (ECA) through loans, guarantees and insurance for investment projects – finance amounts equivalent or greater than official development assistance. Their mandate is to support their country's foreign trade. While current ECA support to climate finance flows are limited, they nevertheless have a role to play given that the provision of (often critical) guarantees for the development of energy sector projects is often at the core of their respective missions.

Following the initiative taken by the United States, a trend has emerged to strengthen the climate dimension of ECA financing. The US agency Exim excluded, except exceptional cases,[1] coal projects. The United Kingdom and France have also voiced support for the end to public support from ECAs for coal-fired power plants, as part of a multilateral agreement under the aegis of the OECD. However, this trend has not yet extended to other G7 countries. Intense discussions are nevertheless underway under the aegis of the OECD to define a new common standard.

The export credit agencies countries party to the OECD's 'Credit Exports Arrangement' were mandated at the Ministerial meetings of the OECD in 2014 and 2015 to study how to contribute to the fight against climate change. To meet this request, and building on a detailed technical study, the OECD working group on this subject reached the following political consensus:

– Firstly, it was decided by the participating Member States that greenhouse gas emissions from all fossil fuel power plants receiving public export support would be reported to the OECD;

– Secondly, the participating Member States have amended the Arrangement's sectoral annex on climate change to propose more favorable instruments and policies to support projects contributing to the fight against climate change in order to encourage exports in this area. Discussions are underway to include increased support for the exports of 'smart' power grids that allow CO2 emission reductions by 20%.

In an environment where political agreement is still limited on the integration of climate change by credit export agencies, we recommend that leading agencies on this topic work together to build the best standards, in addition to the commitments made in the multilateral context of the OECD. ■

3.6 MOBILIZING PRIVATE FLOWS TOWARDS THE TRANSITION OF A LOW-CARBON ECONOMY

3.6.1 The initiatives of private financial sector actors to finance the transition to a 2°C economy

From the United Nations Climate Summit in September 2014 to the Climate Finance Day in May 2015 hosted by the Caisse des Dépôts (CDC), European Investment Bank and Paris Europlace, private financial sector actors have increased the nature and scale of their commitments related to climate change. Two of the principal types of commitments are outlined below.

Improved understanding of climate risk exposure of investors

The first type of commitment has focused on improving the understanding of financial sector actors exposure to climate risk. Climate risk refers to both policy-related carbon risk (e.g. how will the business model of the company invested in be affected by the implementation of a carbon price or a norm limiting GHG emission?); and risk stemming from the physical impacts of climate change (e.g. the impacts on supply chains or on infrastructure by sea-level rise, changes in the hydraulic cycle, etc.). Currently, this second physical risk has been the most present in the initiatives by financial sector actors. Indeed, a company whose production relies heavily on water resources may see the number of days where, due to increased droughts, it is unable to produce at full capacity. This risk therefore has a financial impact on company, and consequently an impact on shareholders and investors. Rating agencies, particularly Standards and Poor's, are working towards improving the integration of this risk in their analysis. S&P will publicly disclose the results of its work on this topic before CoP21.

Insurance companies also have a direct interest in the improved inclusion of climate risks into their business models and insurance policies. As such, some companies have signed on to an initiative led by Willis Group to review risk management systems to provide improved information to market actors on the incremental cost stemming from the increased frequency and intensity of extreme weather events.

Disclosing the carbon footprint of investment portfolios

The second type of commitment focuses on disclosing the carbon footprint of investment portfolios. This can include both the direct and indirect emissions funded by investors, whether in stocks, company bonds, or infrastructure projects (the latter particularly in the case of infrastructure funds). This is the explicit objective of the Montreal Pledge, which has been signed by 49 investors representing $ 1.5 trillion of assets under management and aims to reach $ 3 trillion of assets under management before December 2015.[1] Carbon footprint measurement can also include commitments to reduce this footprint, also called 'decarbonisation.' This is for instance the case of the Portfolio Decarbonisation Coalition, with 12 investors representing $ 45 billion of assets under management and which aims to gather $ 100 billion of assets under this 'decarbonisation commitment' before CoP21.[2]

1. Data from May 2015, Montreal Pledge website.

2. Coalition run jointly by the Montreal Pledge, Amundi, CDP and AP4.

Reducing the carbon footprint of investment portfolios through a number of often complementary actions:

First, divesting from fossil fuels. The Norwegian sovereign wealth fund (GPFG) is one of the largest institutional investors in the world, with a volume of $ 890 billion in 2014, or approximately 1% of global market capitalisation. GPFG recently announced on June 5th, 2015, its intention to divest over $10 billion of its investments in coal. Furthermore, in May 2015, Axa committed to divest from companies that either generate more than 50% of their turnover coming from coal or use an energy mix composed of 50% of coal. Second, shareholder activism: shareholders request that companies in which they invest to reduce their GHG emissions. This type of commitment was made by Caisse des Dépôts in May 2015. This has also been the approach used recently by shareholders of companies such as Shell and BP who requested at the most recent General Assemblies that these companies test their business models under an economic scenario coherent with the 2°C limit. Thirdly, dynamic portfolio management: overweighing companies that are the most active in decarbonising the economy. This is for example the choice made by Mirova, the asset management branch of Natixis Group.

All of these approaches are complemented by commitments to invest more in "green" projects and companies. Indeed, in New York in September 2014, the insurance sector committed to doubling its green investments to reach $ 82 billion in 2015. Increasing green funding is also one of the commitments tracked by the Investors' Platform for Climate Action[1] launched by the Institutional Investors Group on Climate Change (IIGCC) in May 2015 in Paris. To date, this platform has gathered more than 400 investors from more than 130 countries and represents more than $25 trillion of assets under management.

Through these non-exhaustive examples, it is clear that the dynamic surrounding the commitments made by the private financial sector is expanding in an unprecedented manner. This can be explained in particular by the fact that climate risk is progressively leaving the zone of "extra financial" risk, and is being directly included in purely financial risk assessment. This is precisely the idea formed by the former Secretary of State of Treasury, Henry Paulson, when he stated *"Climate change poses not just a massive risk to the environment, it's the single biggest risk to the global economy today"*[2]. In the same way that markets created a financial bubble that burst in 2008, they are today creating a 'carbon bubble.' The carbon bubble is the gap between the maximum share of known reserves that the energy sector can exploit to keep global warming below 2°C, and what today is included in their respective corporate accounts and used in market price valuation[3]. In 2014, Mark Carney, the Governor of the Bank of England, was the first to stress this analysis: *"The vast majority of reserves are unburnable" if the world is to avoid catastrophic climate change.*[4]

We thus make the following proposals:

Having made the 'Agenda of Solutions' an essential part of CoP21, France has the legitimacy to encourage private financial actors that have not yet taken explicit, and precise, commitments, to do so before CoP21. This equally implies gathering

1. http://investorsonclimatechange.org

2. See the Risky Business Project.

3. See the work of Carbon Tracker Initiative for further information.

4. Speech during the World Bank seminar of October 2014 on carbon price: http://www.emergingmarkets.org/Article/3389530/Economics-and-Policy/Carney-hammers-the-point-you-cant-burn-all-the-oil.html

the ensemble of commitments on the Nazca Platform[1] initiated by the UNFCCC: this platform aims to improve the clarity and visibility of these commitments, as well as establish a monitoring system to follow implementation (see Section 4). Indeed, the non-fulfilment of these commitments would be damaging to the credibility of the signal currently given by financial sector actors.

These initiatives by private actors demonstrate the way forward. However, in order to reach the scale of action needed to ensure the emergence of an economy coherent with the 2°C limit, voluntary actions should be strengthened by legislation that France could support in a European and international context – as well as domestic action. This is explored in the following section.

3.6.2 Initiatives to integrate the climate challenge in financial regulation

The Investor Platform, launched in Paris in May, manages $25 trillion in assets, distinguishing four types of commitments: measuring, engaging (shareholder engagement), reallocating (including the decarbonization of portfolios) and reinforcing action on the fight against climate change (dedicated investments, e.g. green bonds). Policymakers have an opportunity to speed up these ongoing dynamics.

At the international level, an important first milestone was reached in April 2015 by the initiative of France and the Governor of the Bank of England, also chairman of the Financial Stability Board. The G20 finance ministers have requested that the FSB "review how the financial sector can take account of climate-related issues". A first report is expected in September or October 2015, in the context of the Annual Meetings of the IMF and the World Bank.

At the national level, many initiatives have been identified by the UNEP Inquiry into the Design of a Sustainable Financial System. This initiative was established in January 2014 in order to inventory the links between financial regulation and sustainability, and to propose possible improvements. These are presented in its latest progress report "The coming financial climate," published in May in Paris. Examples include actions taken by the People's Bank of China as part of a work program related to the construction of the next five year plan (2016 - 2020) aiming at "establishing China's green financial system."[2] The Central Bank of Bangladesh has already implemented different bank refinancing rates according to the "green" quality of projects that are financed by the banks. Another example is that of the Bank of England which, as a supervisor, requires insurers to review their assessment of climate risk, and is discussing, as a central bank, to have its Financial Policy Committee take climate change issues into consideration as an element of risk to financial stability.

It is interesting to note that the integration of sustainability issues, and especially climate, into the financial regulation is not an agenda initiated solely by developed countries. This is rather a growing concern around the world, at parity between emerging, developing and developed countries.

The integration of climate issues into financial regulation by Nation States, supervisors and regulators can take several forms, which are summarized in the chart below:

1. http://climateaction.unfccc.int/companyindustries.aspx?finance=true

2. UNEP Inquiry (2015b) Establishing China's green financial system. UNEP Inquiry into the Design of a Sustainable Financial System.

Figure 24 The different means of integrating climate change into financial regulation

A. Expand the scope of risk management

1. **Banking:** Place long-term sustainability and climate factors in risk management systems and prudential approaches for lending and capital market operations ('green credit')
2. **Investment:** Ensure that institutional investors (including pension funds) manage long-term climate factors as part of core risk, fiduciary and other investment obligations
3. **Insurance:** Integrate long-term climate factors into wider insurance frameworks for inclusion, solvency, underwriting and investment
4. **Stress Testing:** Across financial sectors and markets, develop scenario based tools to enable a better understanding of the impacts of future climate shocks on assets, institutions and systems

B. Enable the orderly reallocation of capital

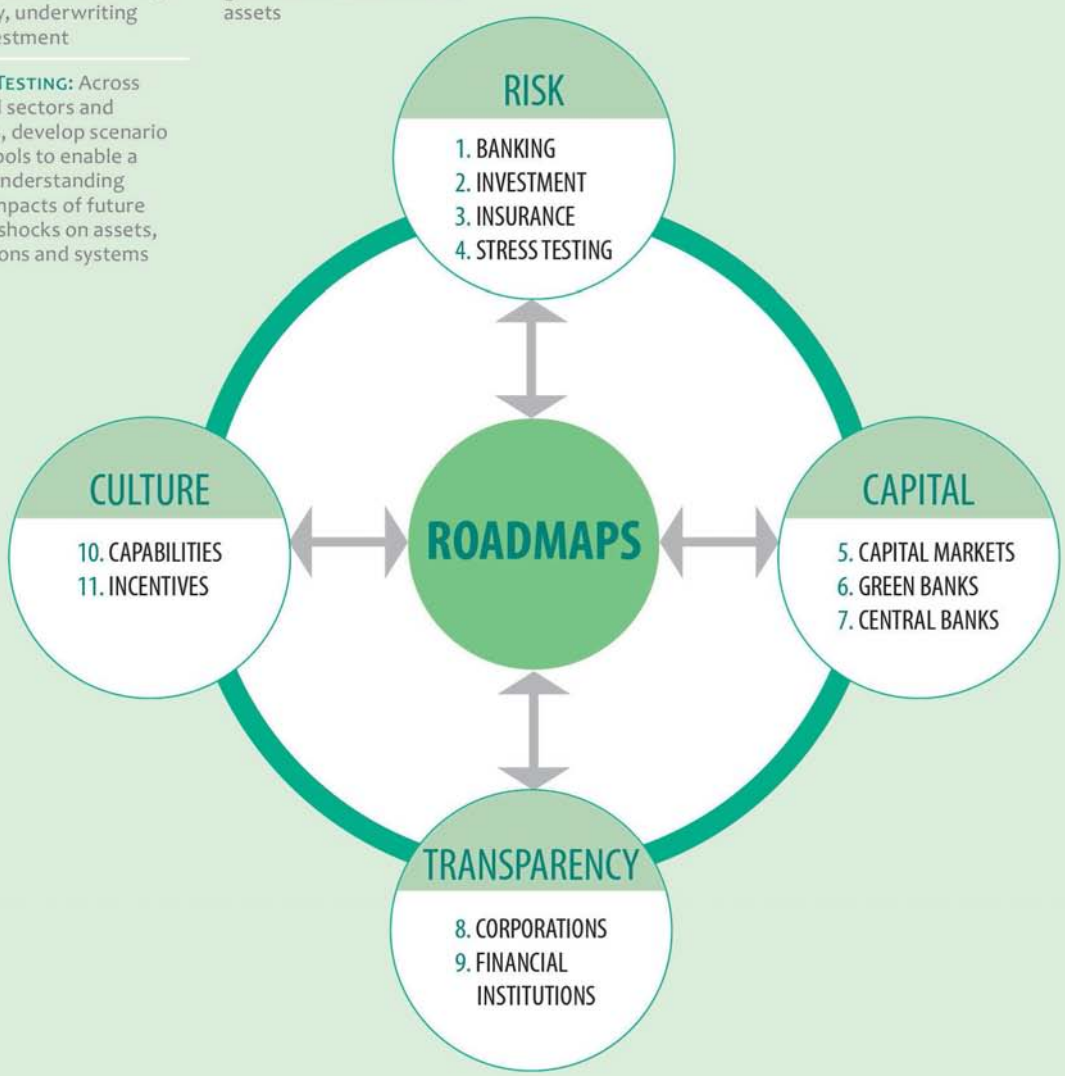
5. **Capital Markets:** Upgrade debt and equity capital markets through standards, regulatory refinement, indices, enhanced analysis and fiscal incentives
6. **Green Banks:** Establish green investment banks to strengthen the structure of the financial system and crowd in private capital
7. **Central Banks:** Review monetary operations including collateral, refinancing, asset purchases and others to incorporate green finance and climate assets

C. Make transparency systemic

8. **Corporations:** Ensure that corporations and issuers of securities publicly report on critical sustainability and climate factors to investors and other stakeholders
9. **Financial institutions:** Enhance disclosure by financial institutions on allocations to green assets, climate performance and exposure to risk, as well as integration in investment analysis

D. Strengthen financial culture

10. **Capabilities:** Build capabilities among financial professionals and regulators on sustainability and climate factors
11. **Incentives:** Link remuneration, compensation and broader incentive structures with sustainable value creation over the long-term



Source : UNEP Inquiry 2015

Without going into the details of each proposal, we recommend that France act on the following points:

Following the adoption of Article 48 of the Energy Transition Law for green growth in May 2015, France is the first country in the world to legally require that managers and asset holders better take into account climate risks, measure the carbon footprint of their financial portfolios, and disclose both the proportion of low-carbon investments and the manner they make their investment strategies consistent with the internationally agreed 2°C limit.

We suggest that France could communicate broadly on these recent legislative developments with other countries. The French government could rapidly propose, at least to its European partners, to move forward in this direction by officially requesting the European Commission to explore this issue at the EU level. Some of these measures have also been debated in Sweden, as well as in in China. We thus propose that France propose to its G20 partners to cooperate on this issue to foster the development of a harmonized regulatory approach that would facilitate the emergence of international standards and strengthen impact.

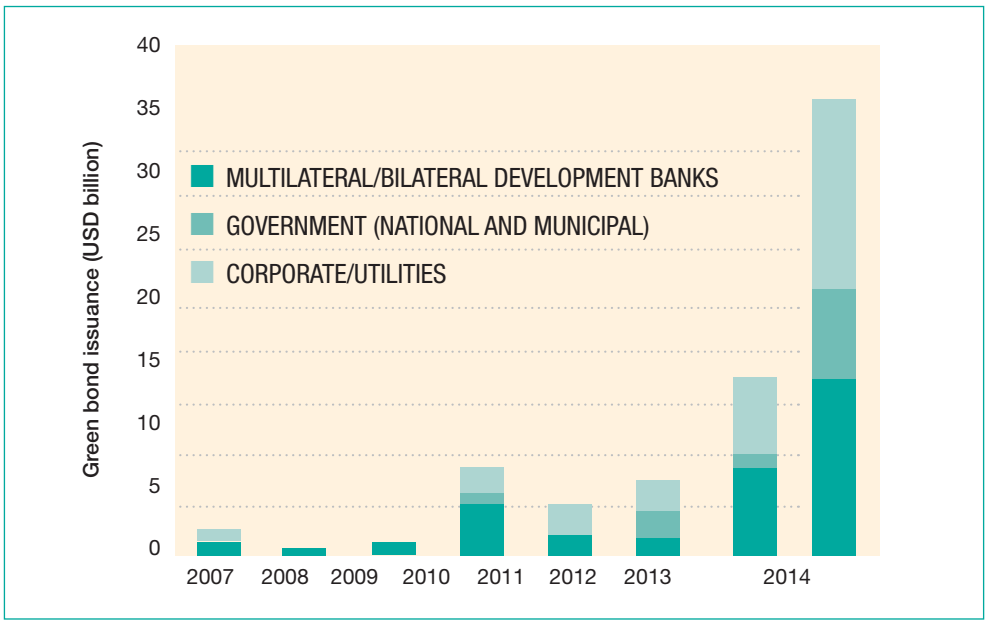
We also propose to explore a method to help integrate climate-related issues into the definition of fiduciary duty. This principal is used by finance sector professionals (directors, managers, agents, advisors, regulators...), as “trusted third parties,” to act in the best interest of their clients. This obligation is called “fiduciary” because it is essentially an obligation of loyalty, honesty and good faith (fides in Latin). To the extent that climate change – and the associate risks – has been demonstrated to exist, it is legitimate to include in the guiding principles - and in the practices of actors - that any inaction to take these issues into consideration places economic actors at risk. This includes households that rely on third parties to act in their best interest, particularly in the context of privately funded pension systems. These issues have already been integrated into the guiding texts in South Africa (2011) and the Netherlands.

To facilitate the optimal functioning of financial markets, information must be available to all participants and regulators. Thus, for regulators to assess the impact of climate change and related climate policies (e.g. carbon price) - on the loan portfolio of a commercial bank, they must have accurate information on the carbon footprint and impact of loans on their books. This information is missing today. In order to build an adequate regulatory system, it is necessary today to put into place the necessary information system. Therefore, in addition to measuring the carbon footprint or impact of institutional investors’ investments, we recommend that commercial banks also communicate on the carbon content of their lending activities (project financing, corporate loans, mortgages, etc.).

3.6.3 Scaling-up the green bonds market

The Background Report on Long Term Climate Finance, commissioned by the German Presidency of the G7 and released in June 2015 presents the recent development of the green bonds market. This market in 2014 totaled $ 53.6 billion across different sectors as seen in the following figure.

Figure 25 The repartition of green bonds by emitter



Source : CICERO/CPI (2015) Background Report on Long-Term Climate Finance, using data of BNEF (2014), CBI (2014a), CBI (2015), World Bank (2015).

Firstly, it is key to note that green bonds in and of themselves do not create additional capital flows.[1] However, the massive growth in volume provides a signal to the market on the materiality of the low-carbon transition thereby increasing attractiveness. There is nevertheless a risk if investors doubt the underlying nature of the assets involved. The green bonds market requires standards that guarantee its integrity and sanctions for non-compliance in order to gain the trust of investors. Standardization could also reduce the cost of issuances. This is supported by the proposals of the UNEP Inquiry in "The future financial climate" of May 2015 in which they call for:

– Establishing standards ensuring the integrity of the market, with sanctions for non-compliance;
– Launching a program of strategic emissions from cities, public agencies and development banks;
– Reducing the issuance costs by simplifying the process;
– Encouraging the securitization of green bonds, for example as part of planned reforms in the European Capital Markets Union;
– Developing purchasing policies by public institutions; and
– Supporting market liquidity.

All of these measures will ultimately improve the comprehension of climate risks by private financial actors and should lead to increased funding for the transition to a low-carbon economy; and inversely less funding for activities incompatible with the 2°C limit. These measures, to be taken primarily at the national level, assist in a better allocation of domestic savings to low-carbon activities rather than developing international flows. This is consistent with the fact that domestic savings will be the principal source of finance mobilized for investment. Nevertheless, the green bonds issued, for example, by development banks can help scale-up private capital flows from high-income economies to finance green projects in the global South.

1. In the case of bank refinancing, they nevertheless would free up capital that can be reinvested.

3.6.4 Adapting international accounting standards

International accounting standards have a significant impact on the decisions of large companies. It is recognized that the current European standards (IFRS / IAS) are not adapted to take into account the business model of long-term investors, or to increasing long-term liabilities.[1] The 2007-2009 crisis highlighted some shortcomings of the "fair-value" principle. This principle is often applied in practice to value financial assets of a company, according to the net present value of cash flows that they will generate in the future. The choice of the discount rate, which should reflect the perceived risk associated with these flows, is a very sensitive parameter in this calculation, and cannot be easily determined for new sectors, and even less so in developing countries. The standards also impose variation in the rate and as such, a variation in the value of the asset as soon as an event affecting this risk occurs. This subsequently causes a certain volatility in company accounts and a need to immediately increase contingency provisions, including on assets with long-term investment horizons.

Discussions are already underway at the International Accounting Standards Board (IASB) on the evolution of the fair value principle. It could be envisaged to link these discussions to the detention of long-term assets such as low-carbon investment projects, to ensure that changes in the regulation do not deter their holding.

We propose that France jointly requests with other countries that the revision by the IASB of international accounting standards take into account climate-related issues. This could include, for example, the inclusion of principles to assess the value of assets in a 2°C scenario.

INSURING AGAINST CLIMATE CHANGE

Physical climate risks are increasingly considered by insurers, namely in the damage branch, given the rising costs of increasingly frequent natural disasters. Links with climate change have already been observed (for example, it is estimated that the real estate value currently threatened by storms in the US amounts to $ 1.5 trillion in mid-2014)[2]. The low level of the integration of climate risks by the sector is due to the lack of historical data. Indeed, while climate change is inevitable, its pace and scale are difficult to establish, since they depend on GHG emissions scenarios. Finally, the risks are cross-cutting and diffuse, particularly in densely populated areas. Nevertheless, climate sciences and modeling are improving and is growing increasingly able to inform stakeholders of climate impacts associated with a particular scenario.
If the amount of damage expressed in dollars is correlated to the economic value of assets currently insured, the most serious damage is observed in developing countries. These countries are most vulnerable to climate change. Furthermore, the population in these countries tend not to have the resources to obtain or access insurance to protect against physical risks (drought, crop losses, flooding) nor to 'build back better'. Thus, the importance of the latest commitment made by G7 countries to facilitate the access for 400 million people in the most vulnerable developing countries to either direct or indirect insurance against accidents generated by climate change. ■

1. See in France the 11.48 recommendation of the White Paper on financing the ecological transition

2. CERES (2014) Investing in the Clean Trillion.

3. UNEP FI (2011) Universal Ownership: Why environmental externalities matter to institutional investors, United Nations Environment Project Financial Initiative.

4. http://www.smithschool.ox.ac.uk/research-programmes/stranded-assets/

MAKING REGULATORY MEASURES CONDUCIVE TO HOLDING LONG-TERM ASSETS (BASEL 3 AND SOLVENCY 2)

With the exception of the Bank of England, the regulators of the banking and insurance sectors have not yet identified the risk of climate change as one likely to affect financial stability, while stability is the objective of financial regulation. This situation could be changing: insurance supervisors have recently become more aware of the importance of the activities of insurers in protecting against natural disasters. The next step will be moving from awareness of the risks posed by climate change, to a proper inclusion of this risk category into the regulatory framework for insurance.

There is almost a zero probability that the impacts of climate change will be null on economic models, assets, infrastructure, capital, the global potential economic growth, etc. For example, a study of 2,400 companies conducted by UNEP FI showed that 50% of their profits are threatened by climate change.[3]

Yet, to date, financial models used within the framework of prudential banking and insurance regulations (Basel 3, CRD4 / CRR, Solvency 2), do not contain any incentive to consider environmental risks. It is important to better understand how this risk will weigh on assets in terms of credit risk, of over-valuation, etc. Moreover, some aspects of the current regulation do not encourage the low carbon transition, which involves risk taking with long pay back periods. Under current regulations, holding of long-term and illiquid assets by banks is currently 'costly' in terms of regulatory capital requirements. Banks are not encouraged to hold them, particularly if their returns are modest, and even though their less volatile charachteristics are a plus within the frame of the current regulations.

Economic theory generally prioritize that policy makers focus on putting into place, at the macro-economic level, a sufficient carbon signal. However, prudential regulations, whose fundamental objective is to ensure financial stability, must contribute to the emergence of an enabling environment for these investments. Unfortunately, in the real world, the level of carbon price and other externalities are neither high enough, nor sufficiently visible. As a result, financial markets do not benefit from the right signals nor the right information. This justifies specific actions. It may appear easier to establish a carbon price signal than to reform the prudential and accounting environment of the banking and insurance sectors. However, this does not appear to be the case: setting a high carbon price has encountered ten years of strong resistance from certain industrial sectors because it directly penalizes their high-carbon activities. The banking and insurance sectors themselves do not have this type of direct conflict of interest. In addition, ongoing work, and in particular those of the Smith School (Oxford),[4] indicated that the interest of the investors is to divest from fossil fuel industries to invest more in alternative energy. The evolution of the prudential and accounting framework would support and accelerate this emerging trend.

Initiatives to develop climate stress tests and assess the carbon impact of stocks, bonds or other assets should be supported in the appropriate international fora to facilitate integration into the prudential monitoring of institutions. We propose that France – as it has already done with the Financial Stability Board in April 2015 – officially request that the Bank for International Settlements (Basel Committee) facilitate discussions in a collective manner. In parallel, the Agence Française de Développement being subject to Basel 3, we propose that the AFD launch a technical analysis of the impact that this type of test would have internally (see Section 3.5.2). ■

3.6.5 What role for the monetary policy in response to climate change?

As mentioned in Section 2.3, the central banks of the United States, the Eurozone and Japan launched quantitative easing policies to tackle the 2008 crisis. These policies are still in place and currently focus on counteracting the risks associated with deflation. The Chinese central bank has also seen its balance sheet increase significantly.

In this context, it appears that central banks have already introduced 'repo' policies (accepting assets as collateral in exchange for a loan), which encompass a broad range of eligible asset classes. The majority of these policies consider that the acceptability of collateral depends solely on its financial rating (mainly integrating the purely financial risk of the underlying asset). Some central banks, such as in China or Bangladesh, are already moving or planning to guide the choice of collateral according to 'green' criteria. The debate is therefore open at the global level.

Moreover, in practice, the European Central Bank has chosen to purchase assets to refinance small and medium-sized enterprises (SMEs), based on strict criteria. In this case, the objective is not to question the relevance of such a decision but to note that, whether in developed or developing countries, the interaction between monetary policy and private capital allocation choices exists.

Therefore, the question of the specific role of central banks in the fight against climate change arises. This is particularly relevant given the probability that climate change will have at least a small – and more likely a substantial - impact on financial stability and the growth potential of economies.

The objective is not to directly favor particular sectors, but rather to improve the integration of the cross-cutting impacts of climate change and the financing of a low-carbon economy. This, in turn, will help avoid and mitigate the risks to future economic growth and prosperity. In a world where the price of carbon could perfectly internalize the value of climate change impacts, there would be little role for monetary policy. However, it is clear that this is unlikely to be the case in the immediate future.

Given that financial markets are not perfectly efficient[1] and that currencies are not neutral in terms[2], the dominant ideology that dictates that the actions of the central bank should not take into account climate risks and the explicit financing of an economy compatible with the 2°C limit may be the subject of discussions, both within each currency zone and at the international level.

We make the following proposals:

– Central banks could include in their annual reports the variation in the relative share of assets that can be labeled as "climate-coherent" in their balance sheet;

– Central banks could establish an official collaboration to identify how these issues have – or could be – integrated into internal processes as well as instruments.

1. The recent Nobel Prize winner J. Shiller has theoretically demonstrated this contention.

2.See, for example : Illusion financière : des subprimes à la transition écologique (Gaël Giraud, éditions de l'atelier, 2014) or the more technical article from Nicolas Bouleau http://www.nicolasbouleau.eu/critique-de-lefficience-des-marches-financiers/.

3. This reserve aims to resorb the increasing surplus of quotas that were not used since 2009 and will limit the number of quotas available on the market between 400 and 833 million.

4. Data from Thomson-Reuters.

MOBILISING THE EUROPEAN UNION

The European Union (EU) has committed to reduce its GHG emission by at least 40% by 2030 compared to 1990 levels. Although this target is lower than scientists' recommend in order to keep global warming below 2°C, the EU is one of the world's most ambitions actors.
Several approaches should be scaled-up to ensure that a viable low-carbon strategy is transversally integrated across the EU' major policy areas.

1. Earmarking a significant share of the Juncker plan towards the energy and ecological transition

This plan is designed to stimulate investment through the creation of a European Fund for Strategic Investments (EFSI) which aims to leverage € 315 billion of total investment between 2015 and 2017. The EFSI will be funded by a guarantee of € 16 billion by the European Commission and € 5 billion pledged by the European Investment Bank, for a total initial capitalisation of € 21 billion. The EFSI aims at a multiplier effect of 1:15 on average in real investments (thus the base of € 21 billion for € 315 billion euros of investments). The EFSI should be established within the EIB as a specialised fiduciary fund to ensure that it is rapidly operationalized and able to access existing EIB expertise. It would be desirable for Juncker plan financing to be conditional on climate co-benefits criteria and the prioritization of projects related to the implementation of the low-carbon transition (energy efficiency and technology projects) given the risk of locking-in new infrastructure supporting a carbon-intensive development model.

2. Effectively supporting the EU ETS carbon price

The current price in the EU Emission Trading Scheme is estimated at 5 euros. This price signal is grossly insufficient to stimulate investment or to incentivise operational improvements from covered entities. EU ETS reform is underway and will start by withdrawing 900 million quotas from the auction calendar between 2014 and 2016. A more structural reform of the EU ETS will be implemented from 2019 with the creation of a "market stability reserve"[3]. Finally, the European Council validated, in October 2014, an increase in ambition for the EU ETS via a 43% emissions reduction target by 2030 compared with 2005 levels.
These reforms aim to avoid a new collapse in price in the short term and favor the emergence of a stronger carbon price signal of between €15-20 /tCO2e in 2020 and € 30-40/tCO2e in 2030 according to latest market analysis forecast[4]. However, this target price remains almost invisible to economic actors. We thus propose that these estimated values be politically backed by governments in order to accelerate their integration in the economic forecasts made by economic actors. In addition, these prices levels are nevertheless well below those recommend by economists; we believe it is thus desirable to continue to propose means of reforming the EU ETS as soon as possible to increase ambition.

3. Creating a financial regulatory framework favourable for financing the transition to a low-carbon economy, for which the EU is largely in charge of in Europe

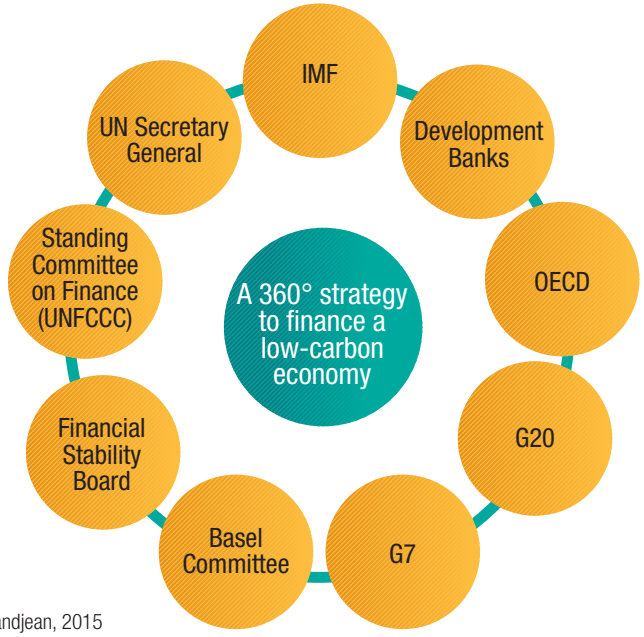
The evolution of financial regulation aiming to reduce the barriers to the long-term financing of banks and institutional investors needs to be accelerated to foster the transition to a low-carbon economy as soon as possible. The European Commission has the responsibility to develop the principal regulatory frameworks for banks, insurances, pension funds, etc. We propose that France, and more largely the European Council, officially request that the European Commission address this issue and proposes a plan of action for the next 2 to 3 years to be delivered ahead of CoP21.
Beyond its national borders, the EU also has a fundamental role in supporting the emissions reductions of its partners. This is particularly true given that EU Member States and the EU as a whole, are altogether the major donors of Official Development Assistance in the world. The inclusion of climate-related issues in the policies of the European Development Fund could be further strengthened. However, it is possible to go a step further by integrating climate into all development policies, whether for infrastructure resilience, support for "climate smart" agricultural policies, or the development of combined grants and loans that facilitate, for example, the increased leveraging of public financing in renewable energy projects for example. ■

4. MONITORING THE LONG TERM IMPLEMENTATION OF THE ROADMAP TO FINANCE A LOW-CARBON ECONOMY

4. MONITORING THE LONG TERM IMPLEMENTATION OF THE ROADMAP TO FINANCE A LOW-CARBON ECONOMY

France is present in all international fora (G7, G20, International Monetary Fund's and World Bank's Board of Directors, OECD, etc.) in which the agenda to finance a low-carbon economy can be moved forward. This constitutes a major asset for the design of a consistent international roadmap dedicated to the mobilisation of public and private financing.

Figure 26 A 360° strategy to finance a low-carbon economy



Source : Canfin/Grandjean, 2015

This roadmap in particular addresses issues related to carbon pricing, infrastructure financing, development banks and financial regulations. At this stage, there is no single international institution in charge of following such an agenda. Yet, part of the success of the political momentum fostered by CoP21 lies precisely in its ability to send a consistent, credible and strong long-term signal to economic decision-makers. Setting a long-term decarbonisation goal for the economy across the 21st Century is a key part of this process and the roadmap proposed in this report presents the financial component of this goal.

Given that the majority of financing of the economy is typically carried out at domestic level, the monitoring of the measures taken to finance the transition must be, first and foremost, anchored in national investment strategies. In the climate arena, this takes concrete form in the Intended Nationally Determined Contributions (INDCs) submitted to the Climate Convention ahead of CoP21. When they exist, this should also be reflected in national economy-wide decarbonisation and adaptation plans.

Our first recommendation is therefore to encourage Governments, beginning with developed countries, to produce national decarbonization strategies for their economies and its financing, both public and private. This measure was adopted,

in principle, by France in its law on energy transition for green growth and by G7 countries in June 2015. Among the key indicators for such strategies could be the relative volume of 'green' investments compared with total global investments made each year, combined with annual targets. France could propose to the IMF to monitor this indicator, country by country, and to aggregate investment levels at the global level.

These strategies could, when relevant, use the OECD's recent work that has, for the first time, analysed the alignment of public policies with a low-carbon, resilient transition and includes the taxation and financing of the broader economy.

This assessment has been officially released in June 2015. We propose that France be one of the first countries to apply the lessons learned from the report and assess the alignment of its public policies with the low-carbon transition; as well as invite other countries to do the same.

In addition to these national actions, the roadmap to finance a low-carbon economy proposed here should be monitored at the international level. As such, we recommend:

– The IMF and the World Bank could be charged with the supervision and implementation of this roadmap, in coordination with the institutions deemed relevant to perform this task – particularly those under the UNFCCC. The objective will be to monitor in particular the developments in terms of carbon price signals (including the phasing out of fossil fuel subsidies); the reforms removing barriers to investments in low-carbon infrastructure; the '2°C roadmaps' of development banks; the integration of climate risk in financial regulation; the relative volume of 'green' investments compared with total global investments; and the evolution in the decoupling of GDP and greenhouse gas emissions.

– The monitoring of reforms related to the inclusion of climate and carbon risks into financial regulation; as well as the commitments taken by private financial actors in order to build concretely on recent progress. As discussed above, the G20 Finance Ministers requested earlier this year that the Financial Stability Board analyse the potential impacts of climate change on financial stability. We propose that G20 include these recommendations in their 2016 work program. Furthermore, we recommend the creation of a public monitoring system for financial actors' engagements that have multiplied in recent months, including: the integration of climate risk;, measuring greenhouse gas emissions induced by their financial activities; and increasing financing for the green economy. The UNFCCC's Nazca Platform, which centralizes these commitments, can be used and further developed for CoP21 in order to increase the visibility of progress in this area within the broader 'Agenda of Solutions.' These commitments could be comprised in an annual public report.

In this process, it is essential to find the appropriate place for the United Nations Framework Convention on Climate Change. The UNFCCC cannot ensure the monitoring and reporting on the ensemble of activities linked to the needed reforms; particularly in in arenas already under oversight of institutions - such as the Financial Stability Board. Nonetheless, it is important that the Standing Committee on Finance (SCF) be associated with the implementation and follow-up to the roadmap to finance a low-carbon economy. This could occur through its participation in associated work programs as well as regular reporting of the progress made to the relevant institutions of the UNFCCC.

5. APPENDICES

5. APPENDICES

ACRONYMS LIST

ABS – Asset-backed security

ADB – Asian Development Bank

ADEME - Agence de l'Environnement et de la Maîtrise de l'Energie

ADF – Asian Development Fund

AFD – Agence Française de Développement

AfDB – African Development Bank

APEC – Asia-Pacific Economic Cooperation

BAU – Business as usual

BNDES – National Bank for Economic and Social Development, Brazil

BNEF – Bloomberg New Energy Finance

BRICS – Brazil, Russia, India, China and South Africa

CAPM – Capital Asset Pricing Model

Cat DDO – Catastrophe Deferred Drawdown Option

CCS – Carbone capture and storage

CO2 – Carbon dioxide

CoP – Conference of Paris

CPI – Climate Policy Initiative

DFI – Development finance institution

EBRD – European Bank for Reconstruction and Development

ECA – Export-credit agency

ECB – European Central Bank

EFSI – European Fund for Strategic Investments

EIB – European Investment Bank

ETS – Emissions trading scheme

EU – European Union

Fed – Federal Reserve System

FTT – Financial transaction tax

GDP – Gross domestic product

GHG – Greenhouse gas

GPFG – Government Pension Fund Global, Norway

GW – Gigawatt

IAS – International Accounting Standards

IASB – International Accounting Standards Board

ICAO – International Civil Aviation Organization

ICR – Issuer Credit Rating

IDA – International Development Association

IDFC – International Development Finance Club

IEA – International Energy Agency

IFC – International Finance Corporation

IFRS – International Financial Reporting Standards

IIGCC – The Institutional Investors Group on Climate Change

IMF – International Monetary Fund

IMO – International Maritime Organization

IPCC – Intergovernmental Panel on Climate Change

IRR – Intern rate of return

KfW – Établissement de crédit pour la reconstruction, Allemagne

KWh – Kilowatt-hour

LDC – Least developed country

MDB – Multilateral development bank

MIGA – Multilateral Insurance and Guarantee Agency

NCE – New Climate Economy

NDB – National development bank

NGO – Non-governmental organization

OECD – Organisation for Economic Co-operation and Development

OFCE – Observatoire français des conjonctures économiques

OPIC – Overseas Private Investment Corporation, United States

PCS – Preferred creditor status

PPP – Purchasing power parity

PRG – Partial risk guarantee

PRGF - Poverty Reduction and Growth Facility

REI4P – Renewable Energy Independent Power Producer Procurement Programme, South Africa

SDR – Special drawing rights

SME – Small and medium-sized enterprises

TNO – Netherlands Organization for Applied Scientific Research

UNEP – United Nations Environment Programme

UNEP FI – United Nations Environment Programme Finance Initiative

UNFCCC – United Nations Framework Convention on Climate Change

UNSG – United Nations Secretary General

WRI – World Resources Institute

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MOBILIZING CLIMATE FINANCE A ROADMAP TO FINANCE A LOW-CARBON ECONOMY