

The implications of 2015 for Financing Climate-Consistent Development

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L'intégration des politiques climatiques et de développement gagne en importance suite à l'accord de Paris (COP 21) et à l'adoption des objectifs de l'ONU pour le développement durable en 2015. En cohérence avec l'objectif des 2°C, l'ONU estime ainsi qu'il sera nécessaire au niveau mondial d'atteindre un pic des émissions de gaz à effet de serre avant 2030, puis zéro émissions nettes d'ici la fin du siècle. Une telle trajectoire nécessite une transformation profonde du secteur énergétique. Pour se faire, il est nécessaire de disposer de ressources financières suffisantes, mais aussi d'enclencher des réformes structurelles afin de soutenir efficacement une économie bas carbone et résiliente aux changements climatiques. En pratique, cela passe notamment par la mise en place de politiques climatiques ambitieuses et crédibles (marché ou taxe carbone), mais aussi par un ensemble de mesures afin d'améliorer l'attractivité de l'économie bas carbone auprès de l'ensemble des acteurs du secteur financier (sources de financement, coûts du capital, perception et gestion des risques, ...).

The Post-2015 Climate-Development Nexus

A number of international milestones marked 2015 as a seminal year with long-term implications for countries bordering the Atlantic and around the globe. From the adoption of the 2030 Development Agenda that comprises 17 Sustainable Development Goals to the Paris Climate Agreement, a clear signal has been issued by the international community on the transversal nature and important complementarity of the climate and development agendas. If concrete actions match announced ambitions, this portends to have far-reaching, transformational implications for energy production and consumption.

For the first time, both developing and developed countries have been called by the international community to take climate change into consideration as the world focuses on achieving the ambitious goal of “zero-net” emissions by the end of the century. As such, each country has committed to putting forward its contributions to this global goal, taking into consideration its particular circumstances. In all countries, achieving these shared objectives will require transforming the energy system, in many instances taking the form of a “revolution” to replace the current dependency on carbon-intensive sources. This requires both direct incentives to foster investment, but also the creation of a regulatory and investment environment within which low-carbon, climate-resilient projects become competitive and provide financial returns. Furthermore, it is increasingly recognized that financing the massive investment necessary worldwide requires increasing

international public climate finance as well as redirecting in-country public and private flows.

This article briefly examines the issues at stake for the energy revolution and discusses what current research indicates it might look like⁽¹⁾. It lays out what appears necessary to achieve these objectives not only in terms of financial resources, but also the broader policy frameworks that countries will need to implement to put low-carbon, climate-resilient development on equal if not better footing than traditional fossil-fuel intensive growth. Importantly, these efforts require linking policy frameworks so climate considerations are incorporated holistically across economies.

After Addis-Ababa & Paris: A Global Mandate for linking climate & development

Two important events occurred in 2015 that have broadened – and linked – the climate and sustainable development agendas for all countries worldwide irrespective of level of development.

The 2030 Development Agenda adopted in Addis Ababa in July 2015 comprises 17 Sustainable Development Goals (SDGs) and builds upon the Millennium Development Goals. These new SDGs have a broader scope, covering all countries – both developed and developing – and identify climate action and sustainability as a central piece of advancing long-term development objectives.

In December 2015, at the 21st Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), 195 countries adopted

the Paris Agreement and reaffirmed the internationally accepted intention of placing all countries on a pathway to limiting the global rise in global average temperature to well below 2°C. Article 2 of the Paris Agreement lays out three objectives to strengthen the “global response to the threat of climate change” and the achievement of what is increasingly seen as a low carbon, climate resilient (LCCR) development model. The agreement seeks to :

- Contain the rise of global mean temperatures “well below 2°C above pre-industrial levels, and to pursue efforts” to limit the warming to 1.5°C;
- Increase “the ability to adapt to the adverse impacts of climate change... in a manner that does not threaten food production” by promoting resilience and low greenhouse gas emission development; and
- Make financial flows consistent with low greenhouse gas emission development.

This commitment translates into a need to achieve “net-zero” emission levels worldwide by the end of the century. Achieving zero aggregate emissions implies both substantial reductions as well as increasing carbon sinks to remove greenhouse gas (GHG) concentrations. The Agreement makes it clear that these objectives cannot be fulfilled outside of sustainable development and poverty eradication efforts in all countries.

Furthermore, a paradigm shift has occurred as the Sustainable Development Goals and the Paris Agreement both abandon a distinction between “North” and “South” and moves to a collaborative approach of nations, all contributing at the scale of their capacities and/or responsibilities to tackling these universal global challenges.

This shared ambition – and commitment to contribute – creates a new opportunity to work cooperatively and share approaches to achieve objectives. As such, the countries surrounding the Atlantic are now increasingly called to learn from one another and work together to conceptualize, finance, and implement the necessary changes in their socio-economic systems.

The shared challenge of achieving ‘net-zero emissions development’

Countries around the world are now faced with the shared challenge to reduce their greenhouse gas emissions, increase the resilience of their social-, economic-, and eco-systems to unavoidable changes in climate, and promote sustainable and inclusive economic growth. This poses many challenges without clear and easy solutions. Above all, in the medium and long-run a ‘net-zero emission development’ implies a significant reduction of the use of fossil fuels – and the enhancement of carbon sinks (whether man-made or natural). Nevertheless, it is increasingly accepted by countries both around the Atlantic and worldwide that a key part of

achieving commonly held climate and development objectives will require the decarbonization of the energy system, although the speed at which this must happen for a given country may vary depending on its national circumstances, including its level of development.

The fossil fuel industry has been an undeniable catalyst for growth and an important source of revenue for countries, companies, and the broader financial system. Convincing the broad range of political, economic, and other actors involved in this sector of the need to decarbonize the economy poses significant challenges. This is particularly relevant given that known and potentially exploitable fossil fuel reserves continue to grow and are far from being fully exploited. As shown in Figure 1, the potential CO₂ emissions linked to exploiting these known reserves far exceeds the emissions remaining in the “global carbon budget” that the world can allow itself to maintain any hope of remaining below the 2°C target. Furthermore, given that scalable carbon capture and storage (CCS) technologies that would allow the use of an increased portion of these reserves remain beyond reach with limited long-run benefits⁽²⁾, it is increasingly clear that a deliberate choice must be made by both political and economic actors to wean themselves from fossil fuels and spark a green energy revolution.

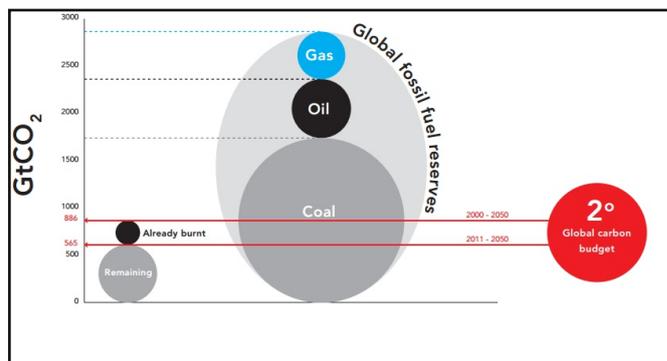


Figure 1 : Comparison of the global 2°C carbon budget with fossil fuel reserves CO₂ emissions potential
Source: Carbon Tracker Initiative, 2014⁽³⁾

Learning from the first round of NDCs : steps forward, but insufficient to reach a net-zero world

The Sustainable Development Goals and the Paris Agreement firmly place national action for all countries at the heart of cooperative global action. This evolution solidifies the linkage between promoting economic and social development in all countries, and the need for this to occur in a manner that rapidly reduces greenhouse gas emissions and increases resiliency to future climate change.

The Paris Agreement confirmed and institutionalized this process, creating Nationally Determined Contributions (NDCs). These documents lay out how each country plans to address climate change domestically and to contribute to achieving international objectives. To date,

189 states parties have submitted Intended Nationally Determined Contributions (INDCs) ⁽⁴⁾. By 2020, all countries are to communicate NDCs containing a strategy for up to 2030 ; thereafter, at least every five years a new and more ambitious NDC has to be communicated. This aims to create a “ratcheting up” architecture to link national ambition, priorities, and policies to overarching international goals.

The objective behind this process is to have countries successively communicate their NDCs in a coordinated manner around the five-year review milestones. This would thus give momentum and encourage countries to enhance their ambition – although to date the only compliance mechanism is based on ‘name and shame’ given the lack of a formal, binding sanctions. To increase long-term visibility, the Paris Agreement also invited countries willing to do so to establish mid-century long-term NDCs ⁽⁵⁾. The fact that all countries parties to the UNFCCC are expected to produce and update NDCs every five years represents a significant opportunity to link the achievement of international climate objectives with national policy frameworks and objectives.

However, “Containing the increase in average global temperature well below 2°C” as laid out in the Paris Agreement presents a challenge which remains unmatched by the aggregation of current national ambitions. This is clearly seen in the analysis performed by the UNFCCC secretariat of the INDCs submitted before COP21. Schematically, the “well below 2°C objective” and ideally below 1.5°C implies an emissions trajectory that peaks around 2030, followed by a decrease of emissions that must be increasingly faster. Aggregate emissions from countries most likely must reach before the end of the 21st century a state of “zero net emissions,” or a world where the minimal levels of GHG emissions of human origin are compensated by an equivalent absorption in different natural and artificial sinks.

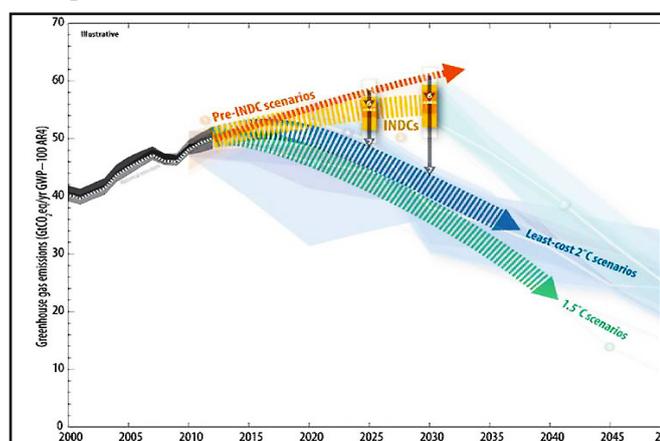


Figure 2 : INDC Emissions Pathways Compared to GHG Mitigation Scenarios

Source: UNFCCC Secretariat, 2016⁽⁶⁾

As seen in Figure 2, current estimates of emissions trajectories laid out in NDCs are insufficient compared to

required trajectories to achieve 1.5 or 2°C scenarios. It is thus crucial that national climate strategies or individual policies and actions must be increased in the aggregate and must fit into national and subnational policy and regulatory frameworks. There is increasing consensus that this cannot be achieved through marginal climate-specific actions, but rather requires the transformation of development models in both the developed and developing world. Achieving this “transition” to a low-carbon, resilient development model implies a number of significant changes in the types of investments that occur, as well as the national and policy frameworks.

Facing the challenges of increasing ambition and investing in a low-carbon, resilient development model

The 2014 report for the Global Commission on the New Climate Economy suggests that between 2015 and 2030 approximately \$93 trillion in financing is necessary to meet infrastructure and development needs without jeopardizing global emission-reduction objectives. This amount represents a net incremental cost of \$4 trillion dollars, a 5 percent increase, in upfront investment between 2015-2030 compared to the required investment of \$89 trillion to maintain or strengthen economic growth over the same period (NCE 2014). Furthermore, if operating costs (i.e. reduced cost of fossil fuels) are taken into consideration, these savings may outweigh the additional capital investment needs by as much as \$1 trillion per year. Other estimates, such as by the IEA, suggest that \$2 trillion per year by 2035 are estimated to be necessary to meet energy infrastructure needs without jeopardizing global emission-reduction objectives. Although this amount represents an additional need of only \$ 400 billion per year compared with business-as-usual scenarios (IEA, 2014), the shift of investments it will require is significant. However, as the Global Commission on the Economy and Climate has reiterated in its 2016 New Climate Economy report – “money alone won’t do the job”⁽⁷⁾. Rather, country by country and region by region the policy and investment frameworks to support this “energy transformation” will need to be identified and put into place.

Overcoming the barriers to low-carbon investment

Achieving this objective will require not only increasing flows to low-carbon projects, but also capping – and reducing – investments in carbon-intensive activities. This will require overcoming a number of barriers to low-carbon investment. Investing in the low-carbon transition poses a number of recognized risks and challenges that often reduces the willingness of both public and private sector actors to take action. For example, one of the most often-cited barriers to this investment in the power generation sector is the fact that investment in renewable energy sources requires large upfront capital investments. Although these investments may require

much lower operating costs, the high upfront volume of capital needed can limit project development. The investment costs of wind energy projects total close to 80 percent of the total costs, compared to the investment costs for gas power representing about 15 percent⁽⁸⁾. In many instances, when combined with other risks this may limit the interest of many investors in renewable energy projects – particularly using technologies or in geographic areas where clear returns on investment have not yet been demonstrated⁽⁹⁾.

Even within European countries, studies have demonstrated how the Weighted Average Cost of Capital (WACC) can vary significantly – between, for example, 3.5 percent in Germany and 12 percent in Greece for onshore wind projects in 2014⁽¹⁰⁾. According to investors, this can be linked to a number of factors such as general country risk, the specific renewable investment risks, and competition (or lack thereof) between debtors. Prohibitively high costs can be further exacerbated in country contexts where non-climate related risks such as currency risks, policy and political uncertainty, and the underdevelopment of financial markets limit both domestic and foreign direct investment (FDI). Low-carbon investment challenges in the developing world are exacerbated by broader barriers to private finance and investment.

Low levels of climate investment in many developing countries may be linked to limited financial sector development are exacerbated by poor infrastructure and regulatory environments that do not foster private sector investment. Important differences exist between developing countries in terms of the level of financial sector development (Table 1), which has a large impact on the ability for project developers – whether public or private – to access debt and equity capital. Given weak regulatory systems, the integration of environmental performance criteria to begin to shift private sector finance towards climate-aligned investments is likely to be ineffective without broader reforms⁽¹¹⁾.

	Level of Financial Sector Development		
	Low	Medium	High
	Low Income Countries	Middle Income Countries	Upper Middle Income and High Income Countries
Banking Services	Basic Banks	Full Range Banks	Universal Banks
Non-Bank Financial Services	None	Government Bonds Equity	Government and Corporate Bonds Equity Alternatives (Private equity, venture capital)
Interest Rate	Administrative Setting	Largely Market Based	Fully Market Based
Access to Finance for SMEs	Limited	Partial	Readily Available
Availability of Long-Term Funding	Limited (up to 1 year)	Partial (up to 7 years)	Full (up to 15 years)
Risk Management	Weak	Adequate	Robust

Table 1 : Differences between local financial sectors in developing countries

Source: World Bank, 2012⁽¹²⁾

Overcoming challenges to infrastructure investment while ‘greening’ the system

The limitations to leveraging financing to support low-carbon investment in both developed and developing countries reveal of the broader difficulties that all infrastructure projects in these countries face. Resolving the imbalances between existing private finance flows between countries and encouraging the private sector to increase its participation through domestic investment, FDI, and lending requires several changes in national policy frameworks. It is key to recognize that private sector participation in investment and finance is linked to perceptions and expectations concerning a broad number of issues including economy, business environment, risk, existing infrastructure, and financial environment⁽¹³⁾. Taking steps to resolve these issues is in the hands of national governments, including the improvement of domestic investment environments (including regarding ownership, transparency, and disclosure) and the development and reinforcement of domestic capital markets.

The targeted provision of tools, products, and instruments building on existing programs – such as the World Bank’s MIGA Agency⁽¹⁴⁾– can also assist in the mitigation of risks and foster an increase of private sector flows. It is, however, essential that the reforms, tools, products, and instruments (Box 2) are appropriately calibrated to support investment and development strategies coherent with long-term GHG mitigation and adaptation objectives. If not, actions may serve only to reinforce existing fossil-fuel based models of development and growth. Moving towards action: the need to broaden the financial discussion

At the COP 16 in Cancún in 2010, the international community recognized the importance to address the specific mitigation and adaptation needs of developing countries, an established a goal of jointly mobilizing a total \$100 billion per year by 2020 towards developing countries.

This is a key piece of the international political negotiations because it focuses on providing financing and hence building trust between developed and developing countries.

However, today the term “climate finance” is often solely linked to this political commitment. For almost the past decade, international climate finance has focused on classifying public (and increasingly private) financial transfers between developed and developing countries as supporting “climate-specific” or “climate-related” projects and objectives⁽¹⁵⁾. It appears now more relevant to address the issue of “climate finance” at the domestic level to focus on how to redirect, align, and scale up the required financial flows to achieve national climate ambitions.

Risk-return profile of investments: a need for domestic policies to spur investment

The key to reorienting and scaling up climate-aligned investment flows is creating a domestic investment environment within which the risk-return profiles of projects are economically and financially competitive and offer returns to investors. For example, as seen in Figure 3, in many instances this requires the introduction of policies to internalize the often unpriced cost of greenhouse gas emissions. When no carbon pricing mechanism – whether direct or indirect ⁽¹⁶⁾– is in place, projects based on fossil fuels are not required to pay the cost of climate-related negative externalities. In many instances, this would serve to make relatively more competitive the often more-capital intensive investment needs of low-carbon development.

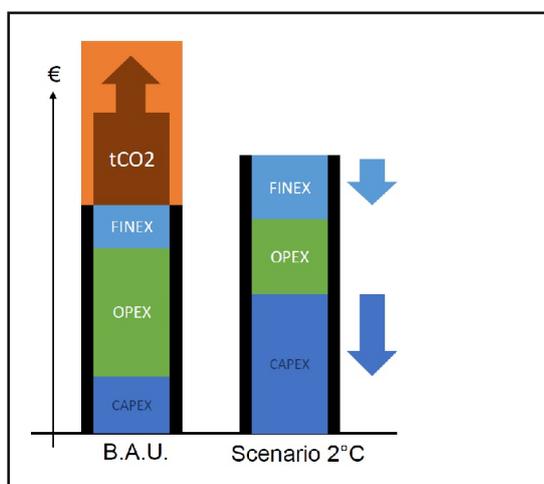


Figure 3: Creating economically viable project models to redirect investments - Source: authors

Secondly, it is important to see what type of policies could be used to influence capital investment (CAPEX), operational (OPEX), and finance-related (FINEX) costs. While CAPEX- and OPEX-related costs often receive significant attention, it is important to take into consideration the costs projects face in securing financing – particularly outside of OECD countries. The perception of project-related risks by the financial sector – and their capacity to estimate future cash flows and returns on investment without sufficient historical evidence – can have a definitive impact on the cost of capital and the feasibility of investments ⁽¹⁷⁾. It is thus essential for policies and support mechanisms to make financial resources directly available (for example through subsidies and feed in tariffs), but also to focus on improving the financial sector’s capacity to recognize and assess the risks and opportunities of renewable energy, energy efficiency, and low-carbon transport projects.

Linking national policy frameworks and the financial value chain to reorient investments for the transition

Financing a low-carbon, resilient economic model requires reorienting or shifting financial flows to

investments that are able to fulfill development objectives in all countries in a manner “consistent” or “aligned” with climate-related objectives. If climate change is addressed as a separate, siloed consideration, flows or asset classes will not be sufficient to reach the scale of investment needed.

As such, it appears necessary that climate change and the transition to the low-carbon, climate-resilient economy that will allow an achievement of long-term objectives be seen as linked to broader national policy frameworks and the financial value chain. To do so, climate-related issues need to be addressed in discussions of financial instruments and direct and indirect support mechanisms – as well as the broader policy framework influencing the risk-return profiles of individual investments.

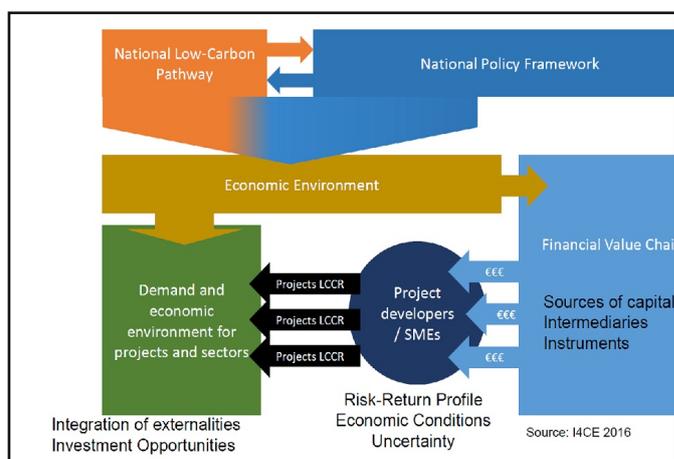


Figure 4: Economic and Investment Environment and the Financial Value Chain

As represented schematically in Figure 4 and detailed in Table 1, a key piece of fostering the shift of financial flows and investment to support the transition to a LCCR economic model is ensuring that the overarching national policy frameworks make this model financially viable. This, in turn, can create an economic environment that creates demand for low-carbon projects and growth in relevant sectors – and a pipeline of projects for the financial value chain. This framework should also incentivize the involvement of project developers to invest due to economic conditions that reduce uncertainty and ensure acceptable risk-return profiles for investors. Finally, this can foster the involvement of the entire financial value chain – including different sources of capital, intermediaries, and instruments.

Developing a comprehensive approach across sectors – often going beyond the traditional realm of climate-related areas – is essential to reorient private investment and financial flows. Addressing each of these different areas within national contexts will be necessary to move away from support for individual or isolated projects toward supporting the reorientation of the entire economy of a given country.

Economic environment creating demand for low-carbon projects	<ul style="list-style-type: none"> • Internalize externalities and other general market barriers (i.e. carbon pricing, etc.) • Regulatory and sectoral support frameworks: <ul style="list-style-type: none"> ○ Performance standards & regulations ○ Subsidies to compensate for non-internalized externalities and other market failures and to foster development of new markets ○ Long-term price guarantee (feed in tariff, etc.)
Incentives to project developers to build capacity and develop projects in this area	<ul style="list-style-type: none"> • Reduce costs as project developers increase knowledge on the financial models and prove investment bankability • Create the network of connections and specialized market players needed to catalyze shift in economy at the scale needed
Foster the involvement of the entire financial value chain	<ul style="list-style-type: none"> • Government signaling of technological and investment priorities • Ensuring the proper functioning and “greening” of the financial value chain by supporting the real economy, long-term investment, and leveraging of different capital sources • Targeted programs by project type which aim to: <ul style="list-style-type: none"> ○ Improve capacity and knowledge of financial actors relating to specific project and investment types ○ Reduce real and/or perceived risks to facilitate private-sector mobilization ○ Overcome sector- or project-specific barriers to accessing the needed form of capital (volume, tenor, overly risk-adverse risk premium pricing, etc.)

Table 2 : Supporting the Climate Coherence of the Economic and Investment Environment and the Financial Value Chain
Source: Authors

Institute for Climate Economics - I4CE

I4CE est un institut de recherche en économie du climat fondé par la Caisse des Dépôts et l'Agence Française de Développement. Le Think Tank fournit une analyse et une expertise des questions économiques liées aux politiques climat-énergie en France et dans le monde.

L'institut a été créé pour accompagner les décideurs publics et privés à mieux comprendre, anticiper et faciliter l'utilisation d'instruments économiques et financiers visant à favoriser la transition vers une économie faiblement carbonée et adaptée aux changements climatiques.

Ian Cochran est un Directeur de Programme à I4CE où il encadre les travaux de ce think tank sur les thèmes de l'investissement, du climat et de la Finance.

Mariana Deheza est chef de projet – Finance, investissement et climat à I4CE. Elle travaille dans le domaine concernant le financement climat des pays en développement et la prise en compte du climat dans la prise de décision des institutions de financement du développement.

Benoît Leguet est le directeur général d'I4CE – Institute for Climate Economics, le think tank sur l'économie de la transition énergétique fondé par la Caisse des Dépôts et l'Agence Française de Développement.

Conclusion

Moving forward from 2015 and the milestone decisions taken, international and national actors must take action to achieve the ambitious objectives they have set for themselves. COP22 in Marrakech was one of the first milestones on the path to ensuring a climate-consistent development pathway. However, it is be just one of many on the pathway to implementing the transformation change required.

In 2017, public and private actors will need to take a systematic approach and make several key structural choices :

- Governments need to clearly demonstrate and mandate their commitment and movement towards a low-carbon energy future;
 - The risks posed by this transition – to both individuals and corporate actors – must be identified and managed to reduce exposure and foster changes in management practice and economic focus; and
 - This will require policies, regulations, and incentives to identify the opportunities to develop new economic sectors and areas for growth – while simultaneously reducing counterproductive subsidies regulations.
- Supporting the climate action around the world will require linking policy frameworks, overcoming existing investment challenges, and co-constructing and implementing nationally appropriate strategies for low-carbon development.

(1) This text is based on one forthcoming report from I4CE, and a forthcoming chapter in the 2016 edition of Atlantic Currents.
 (2) Even if CCS is deployed in line with an idealized scenario by 2050, this would only extend fossil fuel carbon budgets by 125GtCO₂ or approximately an additional 20 percent of the remaining carbon budget. CTI, Unburnable Carbon 2013: Wasted Capital and Stranded Assets (Carbon Tracker Initiative, 2013) <<http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/>>.
 (3) CTI, Unburnable Carbon - Are the World's Financial Market Carrying a Carbon Bubble? (Carbon Tracker Initiative, 2014) <<https://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>>.
 (4) Intended NDCs will have to be converted into “confirmed” NDCs at the moment each country presents its ratification instrument to the UNFCCC.
 (5) Clément Bultheel and others, COP21: Success at ‘the End of the Beginning’, Climate Brief (I4CE - Institute for Climate Economics, 18 December 2015).
 (6) UNFCCC, Aggregate Effect of the Intended Nationally Determined Contributions: An Update: Synthesis Report by the Secretariat (United Nations Framework Convention on Climate Change, 2016) <<http://unfccc.int/resource/docs/2016/cop22/eng/02.pdf>>.
 (7) NCE, The Sustainable Infrastructure Imperative: Financing for Better Growth and Development (The Global Commission on the Economy and Climate, 2016).
 (8) Oliver Waissbein and others, Derisking Renewable Energy Investment. A Framework to Support Policymakers in Selecting Public Instruments to

Promote Renewable Energy Investment in Developing Countries (United Nations Development Programme (UNDP), New York, NY (United States), 2013) <<http://www.osti.gov/scitech/biblio/22090458>> [accessed 27 September 2016].

(9) FTF, Shifting Private Finance towards Climate-Friendly Investments, A Report for EU DG Clima (Financing the Future, 2015)

<http://ec.europa.eu/clima/policies/finance/docs/climate-friendly_investments_en.pdf>; FTF; Paul Noothout and others, The Impact of Risks in Renewable Energy Investments and the Role of Smart Policies (DiaCore, 2016) <<http://climateobserver.org/wp-content/uploads/2016/02/diacore-2016-impact-of-risk-in-res-investments.pdf>> [accessed 27 September 2016].

(10) Noothout and others.

(11) Jan Corfee-Morlot and others, Towards a Green Investment Policy Framework: The Case of Low-Carbon, Climate-Resilient Infrastructure (Organization for Economic Cooperation and Development, 2012).

(12) World Bank, Maximizing Leverage of Public Funds to Unlock Commercial Financing for Clean Energy in East Asia (World Bank Group, 2012).

(13) UNCTAD, World Investment Report (United Nations Conference on Trade and Development, 2014) <http://unctad.org/en/publicationslibrary/wir2014_en.pdf>; ARCADIS, Second Global Infrastructure Investment Index 2014 (ARCADIS, 2014) <http://www.arcadis.com/Content/ArcadisGlobal/Docs/publications/Research/Arcadis_global_Infrastructure_Investment_Index_2014.pdf>.

(14) The Multilateral Investment Guarantee Agency (MIGA) is part of the World Bank Group which offers political risk insurance and credit enhancement guarantees protecting foreign direct investments against political and non-commercial risks in developing countries.

(15) Angela Falconer and Martin Stadelmann, What Is Climate Finance? Definitions to Improve Tracking and Scale up Climate Finance, A CPI Brief (Venice: Climate Policy Initiative, 2014)

<<http://climatepolicyinitiative.org/wp-content/uploads/2014/09/Climate-Finance-Brief-Definitions-to-Improve-Tracking-and-Scale-Up.pdf>>; Falconer and Stadelmann; Jan Corfee-Morlot, Bruno Guay and Kate M. Larsen, Financing Climate Change Mitigation: Towards a Framework for Measurement, Reporting and Verification (Organization for Economic Cooperation and Development, 2009); OECD and CPI, Climate Finance in 2013-14 and the USD 100 Billion Goal (A report by the Organisation for Economic Cooperation and Development in collaboration with Climate Policy Initiative, 2015) <<http://www.oecd.org/environment/cc/OECD-CPI-Climate-Finance-Report.pdf>>..

(16) See OECD, Effective Carbon Prices (Paris: Organization for Economic Cooperation and Development, 2013) <<http://www.oecd.org/env/tools-evaluation/effective-carbon-prices-9789264196964-en.htm>>. for a discussion of different forms of direct (carbon taxes, emission trading systems) and indirect (regulations) carbon pricing in place worldwide.

(17) Noothout and others; OECD, Aligning Policies for a Transition (Organization for Economic Cooperation and Development, 2015); FTF.

Bibliography

- ARCADIS, Second Global Infrastructure Investment Index 2014 (ARCADIS, 2014) <http://www.arcadis.com/Content/ArcadisGlobal/Docs/publications/Research/Arcadis_global_Infrastructure_Investment_Index_2014.pdf>

- Bultheel, Clément, Romain Morel, Hadrien Hainaut, Mariana Deheza, Igor Shishlov, Vivian Dépoues, and others, COP21: Success at 'the End of the Beginning', Climate Brief (I4CE - Institute for Climate Economics, 18 December 2015)

- Corfee-Morlot, Jan, Virginie Marchal, Celine Kauffmann, Christopher Kennedy, Fiona Stewart, Christopher Kaminker, and others, Towards a Green Investment Policy Framework: The Case of Low-Carbon, Climate-Resilient Infrastructure (Organization for Economic Cooperation and Development, 2012)

- CII, Unburnable Carbon 2013: Wasted Capital and Stranded Assets (Carbon Tracker Initiative, 2013) <<http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/>> ---, Unburnable Carbon - Are the

World's Financial Market Carrying a Carbon Bubble? (Carbon Tracker Initiative, 2014) <<https://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>>

- Falconer, Angela, and Martin Stadelmann, What Is Climate Finance? Definitions to Improve Tracking and Scale up Climate Finance, A CPI Brief (Venice: Climate Policy Initiative, 2014) <<http://climatepolicyinitiative.org/wp-content/uploads/2014/09/Climate-Finance-Brief-Definitions-to-Improve-Tracking-and-Scale-Up.pdf>>

- FTF, Shifting Private Finance towards Climate-Friendly Investments, A Report for EU DG Clima (Financing the Future, 2015)

<http://ec.europa.eu/clima/policies/finance/docs/climate-friendly_investments_en.pdf>

- Jan Corfee-Morlot, Bruno Guay, and Kate M. Larsen, Financing Climate Change Mitigation: Towards a Framework for Measurement, Reporting and Verification (Organization for Economic Cooperation and Development, 2009)

- NCE, The Sustainable Infrastructure Imperative: Financing for Better Growth and Development (The Global Commission on the Economy and Climate, 2016)

- Noothout, Paul, David de Jager, Lucie Tesnière, Sascha van Rooijen, Nikolaos Karypidis, Robert Brückmann, and others, The Impact of Risks in Renewable Energy Investments and the Role of Smart Policies (DiaCore, 2016)

<<http://climateobserver.org/wp-content/uploads/2016/02/diacore-2016-impact-of-risk-in-res-investments.pdf>> [accessed 27 September 2016]

- OECD, Aligning Policies for a Transition (Organization for Economic Cooperation and Development, 2015)

---, Effective Carbon Prices (Paris: Organization for Economic Cooperation and Development, 2013) <<http://www.oecd.org/env/tools-evaluation/effective-carbon-prices-9789264196964-en.htm>>

- OECD, and CPI, Climate Finance in 2013-14 and the USD 100 Billion Goal (A report by the Organisation for Economic Cooperation and Development in collaboration with Climate Policy Initiative, 2015) <<http://www.oecd.org/environment/cc/OECD-CPI-Climate-Finance-Report.pdf>>

- UNCTAD, World Investment Report (United Nations Conference on Trade and Development, 2014) <http://unctad.org/en/publicationslibrary/wir2014_en.pdf>

- UNFCCC, Aggregate Effect of the Intended Nationally Determined Contributions: An Update: Synthesis Report by the Secretariat (United Nations Framework Convention on Climate Change, 2016) <<http://unfccc.int/resource/docs/2016/cop22/eng/02.pdf>>

- Waissbein, Oliver, Yannick Glemarec, Hande Bayraktar, and Tobias S. Schmidt, Derisking Renewable Energy Investment. A Framework to Support Policymakers in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries (United Nations Development Programme (UNDP), New York, NY (United States), 2013) <<http://www.osti.gov/scitech/biblio/22090458>> [accessed 27 September 2016]

- World Bank, Maximizing Leverage of Public Funds to Unlock Commercial Financing for Clean Energy in East Asia (World Bank Group, 2012)