

Opportunities for mobilizing private climate finance through Article 6

Perspectives Climate Group, Frankfurt School and Climate Focus

Freiburg, Germany 15.06.2019



Perspectives

Climate Group GmbH
Hugstetter Str. 7

79106 Freiburg, Germany

info@perspectives.cc

www.perspectives.cc

Acknowledgements and disclaimer

The paper has been written by Perspectives Climate Group, Frankfurt School and Climate Focus.

List of authors:

Dr. Axel Michaelowa (Lead author, Perspectives Climate Group)

Dr. Ulf Moslener (Frankfurt School)

Szymon Mikolajczyk (Climate Focus)

Stephan Hoch (Perspectives Climate Group)

Dr. Pieter Pauw (Frankfurt School)

Matthias Krey (Perspectives Climate Group)

Dr. Karol Kempa (Frankfurt School)

Aglaja Espelage (Perspectives Climate Group)

Kaja Weldner (Perspectives Climate Group)

Carsten Jung (Frankfurt School)

This work has been commissioned by the Swedish Energy Agency (SEA) in the context of a framework project on analysis and method development regarding Article 6 of the Paris Agreement. Please note that the views expressed in this report are those of the authors and do not represent any official position of the SEA.

Executive Summary

The ambitious long-term target of the Paris Agreement (PA) can only be achieved if private sector action on climate change is scaled up and global finance flows are reoriented towards low-carbon development and climate resilience. Public climate finance alone will be insufficient to incentivize this structural shift, and governments will need to trigger climate-compatible investments through targeted national policy instruments. International market mechanisms introduced by the PA in Article 6 are expected to play a critical role in creating the right incentives for mitigation activities financed and managed by the private sector. The upcoming Conference of the Parties (COP) in Chile is to deliver a final rulebook for Article 6, which will define the framework within which the private sector can operate and will define how generated mitigation results can be brought to market.

While the price level achieved for internationally transferred mitigation outcomes (ITMO) or Article 6.4 Emission Reductions (A6.4ERs) will be the key driver for private sector engagement in market mechanisms, several other parameters will be relevant: the level of transaction costs, the degree of government interference, the scope of eligible activities, and the stringency of additionality determination and baseline setting. Balancing the delicate trade-off between private sector costs and assurance of environmental integrity is vital if new market mechanisms are to trigger private sector participation in climate change mitigation and adaptation activities at scale.

The Clean Development Mechanism (CDM) and Joint Implementation (JI) provide valuable lessons on how the design of a market mechanism influences its attractiveness for the private sector. The CDM became an early success due to the absence of heavy government involvement and the presence of project developers in developing countries to engage in the production of a new export commodity – emission credits – and leveraged considerable private sector investment along the way. JI, on the other hand, suffered from private sector mistrust that governments would actually issue emission credits. Due to the necessity to account for transfers of mitigation outcomes in the context of Nationally Determined Contribution (NDC) implementation, (host) government institutions will play a greater role than has been the case under the CDM. The interaction between private and public sector actors under both Article 6.2 and 6.4 is just one example of the many factors that private sector participants will consider when evaluating the overall attractiveness of participating in Article 6 transactions.

In this context, this study seeks to answer the overarching question: *How can Article 6 market mechanisms be designed to incentivize mobilization of private financing and contribute to support Article 2.1c in the Paris Agreement?* While a wide definition of climate finance would cover finance triggered by market mechanisms; a narrow definition consistent with Article 9 PA would not cover market mechanism financing that aims to generate market mechanism units (ITMOs/A6.4ERs) for compliance with NDC targets. It should however be noted that no consensus on definitions has been achieved internationally so far.

The first part of our question focuses on the volume of private financing, whereas the second part evaluates the quality of the mobilized financing with regard to long-term greenhouse gas mitigation and

consistency with the main target of the PA. This gives a key role to environmental integrity and cost-effectiveness of the activities undertaken under Article 6, which is necessary if Article 6 is to contribute to a pathway towards low greenhouse gas emissions. This paper analyzes three transversal research sub-questions to provide initial answers to the overarching question:

- 1) *In the short term (until end of 2019):* What rules, modalities, procedures and guidelines are needed in the rulebook for Article 6.2 and Article 6.4 to allow for significant mobilization of private sector finance?
- 2) *In the medium (until end of the 2020s) and long term (beyond 2030):* What are the incentives for the private sector to participate in Article 6 activities, be it as a (co-) financier, project developer, or buyer of generated ITMOs/credits?
- 3) *In the medium and long term:* How can Article 6 activities interact with streams of public climate finance?

One key message for the design of the rulebook on Article 6 is that private sector engagement in international market mechanisms should be promoted through the identification of possibilities to lower transaction costs, while preserving the integrity of the market. Secondly, trust of private and public sector actors in the market is crucial. This can be ensured through setting the rules to allow for a continuity of private sector actions, for instance in the context of the transition of the Kyoto mechanisms.

A third aspect that will determine the success of new market mechanisms is demand for the generated credits, both from private and public sources. Under the CDM, the key price driver for emission credits was the EU Emissions Trading Scheme, but this driver did not persist over time. Criticism linked to the integrity of emission reductions that were claimed for certain types of CDM projects resulted in a limitation on the use of carbon credits within the scheme, which immediately led to a crash of credit prices and stalling of development of new CDM activities. The case of the EU thus again shows the importance of trust in the environmental integrity and the public acceptance of market-based instruments. Therefore, Article 6 mechanisms will appeal to private sector participants only if they present stable, long-term routes to market for the generated emission reduction units. This can be achieved when a sufficient number of governments introduces mitigation policy instruments, be it by means of “carrots” (credit acquisition programs) or “sticks” (carbon pricing or mandatory technology regulation against which ITMOs/A6.4ERs can be used). The increasing number of countries allowing the (partial) use of offsets to comply with domestic carbon pricing regulations is a positive development in this direction.

Finally, higher-cost private sector mitigation can only be mobilized effectively through the blending of ITMO revenues with public climate finance. This blending of different finance streams must be carefully designed in order to prevent double claiming. In these cases, regardless of the share of public climate finance, the entire volume of emission reductions should become mitigation outcomes after having been monitored and verified. The share of mitigation outcomes achieved/targeted through the provision of climate finance should not be transferable and thus be cancelled.

Contents

1. Context and scope of the analysis	8
2. The role of Article 6 in mobilizing private climate finance	11
2.1. The PA long-term finance goal and the private sector	11
2.2. The role of the private sector in providing international climate finance	13
2.3. The PA’s market mechanisms and the private sector	15
3. Accounting for the mobilized private finance under Art. 9	17
3.1. Lack of a common definition of mobilized, private climate finance	17
3.2. Treating market mechanisms in the accounting for mobilized private climate finance	18
4. Setting Article 6 rules to enable private finance mobilization	19
4.1. Creating a framework conducive for private sector engagement	22
4.2. Incentivizing up-scaled supply of mitigation outcomes while preserving environmental integrity	25
4.3. Allowing for enhanced private sector demand beyond NDCs	30
5. Incentivizing private sector participation in Art. 6	31
5.1. Demand side considerations	32
5.2. Supply side considerations	38
5.3. Transversal considerations	44
6. Combining Art. 6 with public climate finance	45
6.1. Results-based climate finance as demand source for Article 6 units	45
6.2. Blending of Article 6 revenues with climate finance	47
7. Mapping research and knowledge gaps	48
8. Conclusions and outlook	53
References	55

Figures

Figure 1: Relationship between the Paris Agreement, climate-compatible finance and market-mechanisms under Article 6 in the context of mobilizing private finance.....	10
Figure 2: NDCs and reference to the use of market mechanisms	32
Figure 3: Private sector mobilization through Article 6 of the PA over time	49
Figure 4: Priority research questions on the mobilization of the private sector through Article 6 in the short term	50
Figure 5: Priority research questions on the mobilization of the private sector through Article 6 in the medium term	51
Figure 6: Priority research questions on the mobilization of the private sector through Article 6 in the long term	52

Tables

Table 1: Accounting for payments for ITMOs in different scenarios	19
Table 2: Research questions on rules for Article 6 conducive for private sector participation.....	20
Table 3: Contentious issues in Art. 6 negotiations	21
Table 4: Research questions on incentives for private sector entities to participate in Article 6	31

Abbreviations

A6.4ER	Article 6.4 emission reduction
BAU	Business-as-usual
BR	Biennial report
CAPEX	Capital expenditure
CBDR-RC	Common but differentiated responsibilities and respective capabilities
CDM	Clean Development Mechanism
CER	Certified emission reductions
CMA	Conference of the Parties serving as Meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
DOE	Designated Operational Entity
ETF	Enhanced transparency framework
FQD	Fuel Quality Directive
GHG	Greenhouse gas
ICROA	International Carbon Reduction and Offset Alliance
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
ITMO	Internationally transferred mitigation outcome
JI	Joint Implementation
KP	Kyoto Protocol
LDC	Least Developed Country
LEDS	Long-term low-emission development strategies
MDB	Multilateral development bank
MFI	Multilateral financial institution
MRV	Monitoring, reporting and verification
NAZCA	Non state Actors Zone for Climate Action
NDC	Nationally determined contribution
NMA	Non market approaches (Art. 6.8)
OECD	Organization for Economic Cooperation and Development
OMGE	Overall mitigation in global emissions
PA	Paris Agreement
PAF	Pilot Auction Facility
PPA	Power purchase agreement
PPP	Public private partnership
RBCF	Results-based climate finance
REDD+	Reducing Emissions from Deforestation and Degradation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SBTi	Science based target initiative
SCF	Standing Committee of Finance
SIDS	Small Island Developing States
UNFCCC	United Nations Framework Convention on Climate Change
VCM	Voluntary carbon market
VCS	Verified Carbon Standard

1. Context and scope of the analysis

Key messages:

- Rules for market mechanisms under Article 6 of the Paris Agreement are to be decided by COP25 in December 2019
- There are two provisions in the PA related to mobilization of private finance: Article 2.1c and Article 9. The former looks more generally into consistency of financing investments with the long-term ambition of the PA, the latter into reporting of climate finance flows from industrialized to developing countries mobilized by public interventions
- This study applies a multi-level analysis to the question how Article 6 mechanisms can mobilize private finance, looking both at ITMO / credit demand and supply.

The 24th Conference of the Parties to the UNFCCC concluded in December 2018 with the adoption of a large part of the so-called “Paris rulebook”, operationalizing inter alia the transparency framework of the Paris Agreement (PA). However, the operationalization of the provisions for the market mechanisms under Article 6 of the PA was postponed to COP25 in 2019 in Chile. Despite good progress in the first week of negotiations, key areas of contention on Article 6 related to accounting, the transition of the Kyoto Mechanisms to Article 6 and the scope of the adaptation tax could not be resolved. Therefore, Article 6 is now the “glaring gap” of the Paris rulebook, while its successful and robust operationalization is key to design a system that incentivizes higher ambition and private sector mitigation action.

In this context, this study wants to answer the overarching question: *How can Article 6 market mechanisms be designed to incentivize mobilization of private financing and contribute to support Article 2.1c in the Paris Agreement?* The first part of the question focuses on the volume of private financing, the second one on the quality of the mobilized financing with regard to long-term greenhouse gas mitigation and consistency with the main target of the PA. This gives a key role to environmental integrity and cost-effectiveness of the activities undertaken under Art. 6 as otherwise Article 6 would not contribute to a pathway towards low greenhouse gas emissions.

In a first step, the general role Article 6 and revenues from the sale of internationally transferred mitigation outcomes (ITMOs) can play in mobilizing private finance is discussed (chapter 2) and associated approaches presented, as transparency is the cornerstone of the Paris regime (chapter 3). Following this introduction, the study analyses the research question at three levels of aggregation:

- The international level, where rules for Art. 6 mechanisms are set and multilateral institutions provide financing
- The domestic level, where policymakers introduce policy instruments to mobilize private participation in Art. 6, and provide co-financing

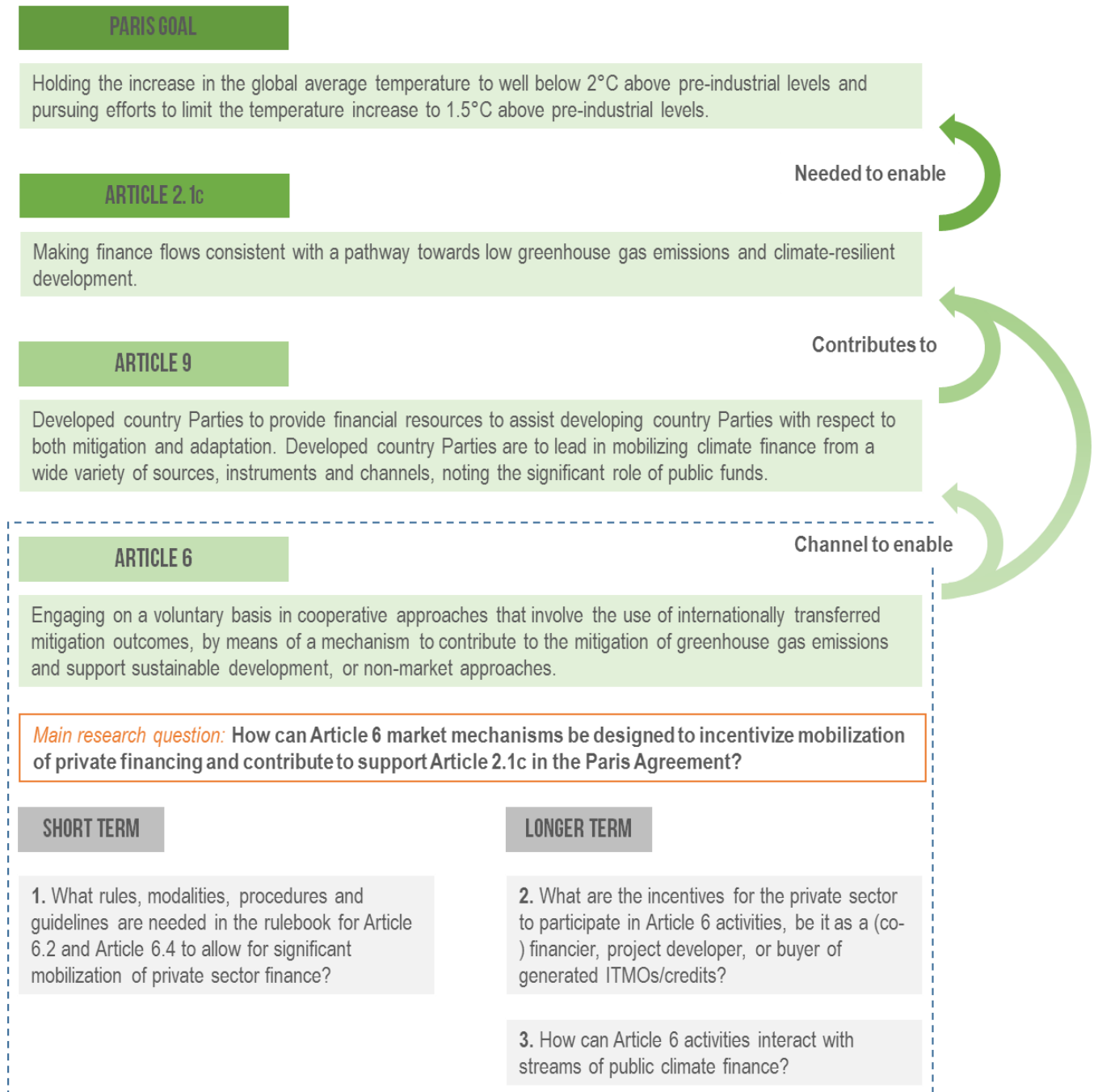
- Private sector “ecosystem” level (see section 2.3 below), including private sector actors that can generate revenues from credits from market mechanisms and thus implement activities that would otherwise not be viable.

Given the broad scope of the research question, an initial analysis in this paper will focus on three transversal issues that define the relationship between the international, national and private sector ecosystem level in the short, medium and long term:

- 1) *In the short term (until end of 2019):* What rules, modalities, procedures and guidelines are needed in the rulebook for Article 6.2 and Article 6.4 to allow for significant mobilization of private sector finance?
- 2) *In the medium (until end of the 2020s) and long term (beyond 2030):* What are the incentives for the private sector to participate in Article 6 activities, be it as a (co-) financier, project developer, or buyer of generated ITMOs/credits?
- 3) *In the medium and long term:* How can Article 6 activities interact with streams of public climate finance?

In responding to these three research questions, the analysis will differentiate between a mobilization of ITMO/credit demand from the private sector ecosystem and generation of ITMO/credit supply. Based on the results of the analysis of the three overarching issues, a scoping exercise is conducted to map research questions and policy design options. Figure 1 below summarizes our approach which will be described in detail in the subsequent chapter.

Figure 1: Relationship between the Paris Agreement, climate-compatible finance and market-mechanisms under Article 6 in the context of mobilizing private finance



Source: authors

2. The role of Article 6 in mobilizing private climate finance

Key messages:

- In order to achieve low carbon investment levels consistent with the long-term ambition of the PA and Article 2.1c, several trillion USD are required annually.
- The 100 billion USD per year public climate finance commitment is a small fraction of this investment need and already includes mobilization of private finance. Definition of what constitutes such finance is heavily contested. Governments need to introduce domestic policy instruments to generate a shift of private finance towards low carbon investments.
- The market mechanisms under the Kyoto Protocol, particularly the CDM, have led to a mobilization of hundreds of billion USD private sector investments in about a decade.
- The price of emissions credits is a crucial determinant of private sector engagement in market mechanisms.

In order to assess how private finance can be mobilized through Article 6, we first need to situate Article 6 in the overall PA framework. We start at the highest level with the long-term finance transformation goal enshrined in Art. 2.1c, before looking at the involvement of the private sector in general climate finance and finally zooming in on Article 6 private sector participation, differentiating between the market mechanisms under Art. 6.2 and 6.4 and the non-market approaches under Art. 6.8.

2.1. The PA long-term finance goal and the private sector

The Paris Agreement (PA) breaks new ground by formulating for the first time under the United Nations Framework Convention on Climate Change (UNFCCC) the collective goal to transform the global financial system, recognizing that tackling climate change will require to shift finance flows towards low-carbon and climate-resilient development and ensure the international climate policy regime is supportive, and not undermining this transition (Whiteley et al. 2018, Bodle and Noens 2018). This objective of scaling-up *climate-compatible* finance is enshrined in Article 2.1c of the Agreement, and is intrinsically linked to the objective to limit the increase of global average temperatures to 2°C above pre-industrial levels while pursuing all efforts to limit global warming to 1.5°C (Article 2.1a) and the aim to increase the ability of our societies to adapt to climate change (Article 2.1b) (UNFCCC 2015).

Reaching both targets under Article 2.1a and 2.1b is conditional on achieving the target under Article 2.1c, as pointed out by the IPCC special report on the 1.5°C temperature goal (IPCC 2018). Reaching a development pathway consistent with the 1.5°C target will require “rapid and far reaching transitions” that are unprecedented in terms of scale and imply a “significant upscaling of investments” in a wide portfolio of mitigation options. For instance, the annual average investment needs for a low-carbon energy sector would amount to USD 2.1 to 4.4 trillion between 2016 and 2035, in a scenario without new climate policies beyond those already in place (IPCC 2018: C.2).

The International Energy Agency (IEA) estimates that on average USD 3.5 trillion would be needed between 2016 and 2035 in order to reorient energy supply investments and upscale low-carbon demand-side investments in line with a scenario that would keep the temperature rise below 2°C. The International Renewable Energy Agency (IRENA) estimates that the global energy transformation will require an additional cumulative investment of USD 29 trillion from 2016-2015 compared to business-as-usual (IEA and IRENA 2017). Bodle and Noens (2018) point out, that despite its importance, Article 2.1c is “under-discussed” in negotiations, as there are no references to specific issues or actions that could help mobilize or redirect financial flows, such as fossil fuel subsidy reforms or carbon pricing. There is also no mandate given in the Paris decision to further elaborate on means of implementation for this Article. However, the progress made with regards to the long-term finance goal will form part of the global stocktake introduced by Article 14 of the PA (Bodle and Noens 2018).

Given that public climate finance can cover only an insignificant share of this volume – public climate finance flows have not exceeded a double digit billion USD figure to date -, mobilization of private sector finance towards low-carbon and climate-resilient investments is key. It is also explicitly included in the definition of the USD 100 billion goal for public climate finance. This is acknowledged in the decision 1/CP.21 adopting the PA but framed in rather general terms:

- In the preamble, Parties agree to mobilize stronger and more ambitious climate action by all Parties and non-Party stakeholders, including the private sector
- In a dedicated chapter on non-Party stakeholders, Parties welcome the efforts of all non-Party stakeholders, including the private sector and invite them to scale-up their efforts and support actions to reduce emissions and/or to build resilience (para 133-134)¹

The role of governments must be to initiate this shift of private finance towards low-carbon investments through dedicated policy instruments including regulation, fiscal policy through “carrots” and sticks, market mechanisms and instruments to overcome information barriers (e.g. labelling) (Gupta et al. 2007, Whiteley et al. 2018).

On the international level, the market-and non-market mechanisms under Article 6 provide a framework under which such policy instruments can trigger private sector activities, and involved governments or private sector entities can generate revenues from the sale of ITMOs. Enhancing private sector participation in the implementation of climate action is clearly stated as an objective of “integrated, holistic and balanced non-market approaches” (UNFCCC 2015, Art. 6, para 8(b)), which could for example be triggered by public climate finance.

¹ Also, the Non state Actors Zone for Climate Action (NAZCA)’s global climate action platform is highlighted. This platform was first created in 2014 upon initiative by the UNFCCC, Peru and France and revamped in 2018 and is a reporting and tracking tool for non-state actors’ climate action around the globe, see: <http://climateaction.unfccc.int/> (last accessed May 7, 2019).

Experience with the Clean Development Mechanism (CDM under the Kyoto Protocol shows that private sector engagement in mitigation investments can be triggered through international market mechanisms very quickly (Michaelowa and Buen 2012, see also section 0 below). This is also acknowledged by the IPCC special report on the impacts of global warming of 1.5°C (IPCC, 2018). The World Bank considers that an international carbon market would have the potential to mobilize annual resource flows of USD 220 billion by 2030 and even USD 2.2 trillion by 2050, while reducing annual mitigation costs by 30% in 2030 and 50% in 2050 (Davies 2018, citing World Bank et al. 2017). In an ideal world, Article 6 would help the emergence of an international carbon market with a unified “currency” that reduces regulatory costs, market volatility and increases market linkages, diversity and efficiency, all key parameters for private sector mobilization (Davies 2018).

2.2. The role of the private sector in providing international climate finance

The PA is not only guided by the three overarching long-term goals but also by additional norms and principles such as the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC).² Regarding finance, this results in the responsibility of industrialized countries to support developing countries through the provision of international climate finance. Prior to the adoption of the PA and on the basis of a pledge undertaken in the 2009 Copenhagen Accord, developed countries committed at COP 16 in Cancun 2010 to mobilize USD 100 billion per year up to 2020 for developing countries from both public and private sources. In Article 9 of the PA, developed countries are now mandated to “take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels” that “should represent a progression beyond previous efforts” (UNFCCC 2015). Article 9 is therefore a crucial complement to Article 2.1c as it specifies that in shifting the flow of investments towards climate-compatible development, developing countries will be supported by industrialized countries but also makes it clear that not all this finance is from public sources, but includes mobilized private finance. The critical, and so far unresolved, issue is now how to define this mobilization.

This distinction between overall flows of *climate-compatible finance* – that can occur within and between industrialized countries³ – and *international climate finance* that is meant to support developing countries is central to the analysis presented in this report.

² CBDR-RC reflects the political consensus that countries have a common responsibility to combat climate change and the adverse effects thereof, but that they may adopt and implement differing commitments based on their diverse circumstances and capacities, their historical contributions to greenhouse gas emissions and their specific development needs (Pauw et al. 2014). The PA introduces a dynamic element to CBDR-RC by adding the qualifier ‘in the light of national circumstances’: as circumstances evolve, so too will the responsibilities of states (Rajamani 2016).

³ For example, the widely used “Landscape of Climate Finance” (Climate Policy Initiative 2018) does not differentiate between industrialized and developing countries.

Accounting for climate finance provided by industrialized countries consistent with Article 9 of the PA faces challenges. First, there is no clear definition of “climate finance” and its differentiation to development assistance, let alone a robust definition of “private climate finance” in the UN texts (see Weikmans and Roberts 2019 for a detailed discussion). While the UNFCCC states that climate finance for developing countries must be “new and additional” to what would otherwise occur, countries have very different understandings of the concept of additionality in financing (for a detailed discussion on baselines to determine additionality of climate finance, see Stadelmann et al. 2011b).

Second, there exist different accounting approaches that do range from accounting for face value of finance regardless of whether it comes in form of grants or loans. Developing countries have criticized industrialized countries for overestimating public climate finance. What is certainly a valid point by developing countries is that there is a wide-spread double counting of climate finance and official development assistance (ODA) among donors.

There is also lack of methodologies to account for *climate-compatible* finance. However, this is less controversial, as Article 2.1c and the shifting of finance flows is a collective goal and not a particular commitment of industrialized countries. The Standing Committee of Finance (SCF) of the UNFCCC included the provisions of Article 2.1c for the first time in its Biennial Assessment (BA) in 2018. This can be seen as a first important step to trigger methodological work on how to properly account for finance in line with the Paris finance goal. Both qualitative indicators and data and quantitative datasets (subdivided into stocks and flows) were considered and categorized divided into the categories bank lending, bond markets, listed equity, private equity, insurance and reinsurance, assets under management, as well as financial services. However, the datasets were not assessed regarding whether they tally with different interpretations or definitions of a pathway towards low GHG emissions and climate-resilient development (UNFCCC 2018).

Although the report finds an increase in climate finance flows, when comparing them with broader finance flows, they are relatively small. Accordingly, it concludes that there is a need to redirect broader financial flows and capital stock to avoid increasing the likelihood of negative climate outcomes to align with the provisions of article 2.1c of the Paris Agreement. Several considerations on how to improve the consistency of wider financial flows with low-emission, climate resilient development pathways are presented. For this, regulatory, economic or information instruments are considered, such as national financial system roadmaps, reorganization of (fossil fuel and land use) subsidies, as well as private sector information platforms, such as the Institutional Investors Group on Climate Change or the recommendations of the Task Force on Climate Related Financial Disclosure (TCFD) (UNFCCC 2018).

2.3. The PA's market mechanisms and the private sector

Historically, international market mechanisms under the Kyoto Protocol (KP), particularly the CDM, strongly involved the private sector (see Michaelowa and Buen 2012 and Lütken and Michaelowa 2008). More than USD 360 billion (mainly private financing) has been mobilized (Shishlov et al. 2015) through over 8000 CDM projects and programmes, for which investment data have been made public. A study on investments in energy efficiency through the CDM and Joint Implementation (JI) shows that carbon offset projects raised almost USD 24 billion of mostly private investments and proved as effective as other international financial instruments. Both flexible mechanisms achieved high leverage ratios of 4:1 and 9:1 in the case of CDM and JI respectively, meaning they mobilized four to nine times the amount of investment from the private sector compared to the amount of carbon finance (Shishlov and Bellassen 2013). This strong private sector engagement was bolstered by the fact that government engagement in the CDM was limited to the provision of an approval letter and thus rather “hands off”. However, private sector engagement slumped when lacking demand for credits led to a price crash from 2011 onwards and also academia’s interest in the topic faded.

In Art. 6 of the PA, market and non-market based instruments are introduced for voluntary cooperation between Parties. These instruments, which explicitly are tasked to build on the experience of the Kyoto Mechanisms, can therefore be used as tools for the mobilization of private sector mitigation action (see also: Davies 2018). We will now differentiate between the market mechanisms under Art. 6.2 and 6.4, and the non-market mechanism under Art. 6.8. The latter will be dealt with in the context of results-based climate finance in chapter 6.

Through market mechanisms several types of private sector actors are mobilized that in their entirety constitute what we opt to call the “private sector market mechanism ecosystem”. This ecosystem encompasses emitting entities that either generate mitigation outcomes or acquire them for compliance or voluntary purposes, private sector (co-)financiers, project developers that implement GHG mitigation technologies, consultants that develop methodologies to assess the mitigation outcomes and support emitters and project developers in the formal documentation of their activities, auditors that verify the mitigation outcomes and traders that help to monetize the generated emission credits. The three latter categories are necessary for the mechanisms to operate, but themselves do not finance mitigation nor generate credit demand. In the context of this paper, we will thus focus on how market mechanisms under the Paris Agreement can mobilize mitigation investments by private sector emitters, (co-)financiers and project developers that constitute this private sector ecosystem.

The ecosystem of private actors will also be influenced by the differences that will come about between the current Kyoto mechanisms and the new markets under Article 6 of the PA, in particular when it comes to the degree of government intervention. The higher relevance of sectoral or policy crediting as well as the needs to safeguard and account for NDC achievement will result in a much more active role for the host and acquiring governments. Further differences will be elaborated and presented in the context of this study.

As a general rule that will guide the thinking in this report, private sector investments in market mechanisms are dependent on the expected return of investments on the carbon credits generated, which depend on the carbon price. The carbon price is in turn determined by the balance of supply and demand for these credits. For example, while CDM and JI credits traded at levels between 10 and 20 € between 2005 and 2011, the saturation of demand for Kyoto credits from the EU in 2011-2012 coupled with the increasing uncertainty regarding the future of the international climate regime led to the collapse of prices of CDM and JI credits to below 1 € per tCO_{2e} after 2013. Several public carbon procurement initiatives such as the Carbon Initiative for Development (CiDev), which was co-financed by Sweden, emerged to sustain high-quality CDM activities that paid premium prices (up to 3 – 7 € per credit) for specific types of activities (mainly of programmatic character and with high sustainable development co-benefits) but these were focused on specific market niches and not intended to lift carbon offset prices more broadly.

Similarly, innovative price-finding mechanisms have been pioneered through a collaboration of the World Bank's Pilot Auction Facility and German-led Nitric Action Climate Action Group (NACAG). This was an attempt to increase the efficiency of determining carbon prices by inviting competitive bidding from private companies for clearly defined types of mitigation outcomes, in this case for nitric acid projects (see Bodnar et al. 2018).

Demand for – and thereby the price of – ITMOs generated under Article 6.2 and credits under Art. 6.4 (A6.4ERs) of the PA will largely depend on the political willingness of governments to introduce mitigation policies consistent with the targets of their nationally determined contributions (NDCs) and long-term low-emission development strategies (LEDS) (Whiteley et al. 2018), and to acquire ITMOs abroad if domestic mitigation is seen as too costly to reach the targets. The more fungible ITMOs are, the higher will be the liquidity of the market and the transparency of market prices. Pure government to government transaction will likely be less transparent, and pricing may be impacted by political considerations rather than only on the basis of the quality of the underlying activities. Given the current tendency for protectionism and skepticism towards international market mechanisms, a critical parameter for acquisition of ITMOs and therefore their price will be their quality, mostly related to environmental integrity, but potentially also sustainable development co-benefits of the underlying mitigation actions. Domestic mitigation policy instruments could for example create ITMO demand from the private sector for compliance, such as in the case of the EU Emissions Trading System (EU ETS) that allowed for the use of CDM and JI credits (within certain limits). Governments could also directly generate ITMO demand – it should be noted that several governments directly bought CERs in the early years of the CDM for compliance with the Kyoto targets – or use ITMOs in the context of results-based climate finance (RBCF) (Hoch et al. 2018). With clear sources of long-term demand from both private and public actors, the Article 6 mechanisms could deliver new opportunities for (scaled-up) private sector participation. This, in turn, would directly support the achievement of the long-term finance goal enshrined in Article 2.1c of the PA.

3. Accounting for the mobilized private finance under Art. 9

Key messages:

- Definitions of mobilized private climate finance vary widely between countries, while multilateral development banks have agreed on a common approach.
- We use net financial support provided to developing countries as basic definition.
- Payments for credits under market mechanisms qualify under Article 2.1c but not as mobilized climate finance under Article 9, unless the credits are cancelled.

The PA relies on the ambitions of bottom-up pledges of its Parties in their NDCs. Robust transparency and accounting rules are crucial for building trust among countries and track progress towards the PA targets. There is no requirement for reporting on Article 2.1c, also because it is no requirement to include information on Article 2.1c in NDCs (Whiteley et al. 2018). We thus do not discuss any 2.1c-related issues in sub-section 3.1 which looks at the reporting requirements of developed Parties under Article 9.1 and 9.3 on *climate* finance provided to developed countries. Reporting under Article 9 is a highly political issue in the current negotiations on the finalization of the PA ‘rulebook’.

3.1. Lack of a common definition of mobilized, private climate finance

While a large part of the inconsistencies between public climate finance numbers reported by governments discussed in section 1.1 above lies in the differences in accounting for loans at face or grant equivalent value (see for instance Oxfam 2018), the definition of “mobilized private finance” is also key. Currently, there is no common definition of “mobilized private finance” for governments to base their claims of progress with regard to Article 9 of the PA (Stadelmann et al. 2013), and no convergence of the approaches applied by different institutions and countries is currently visible. This situation and the persisting data gaps are also deplored by the Standing Committee of Finance (SCF) in its latest biennial assessment of climate finance flows (UNFCCC 2018).

Mobilization of private finance is mostly a result of combined effects of different public interventions (direct mobilization) and broader enabling conditions (indirect mobilization). For instance, project-level public finance or economic policy instruments such as tax breaks or feed-in tariffs can mobilize private finance directly by improving the risk-return profile of an investment. Indirect effects of these interventions as well as of capacity building efforts are notoriously difficult to quantify (OECD 2017). In addition, the public sector tends to overestimate its mobilization abilities because it does not account for the fact that some of the co-finance may have flown anyway due to economic attractiveness of the underlying projects, i.e. not being additional (Stadelmann et al. 2011a). The OECD therefore defines mobilized private finance as private finance associated with activities where there is a clear causal link between a public intervention and private finance, and where the activity would not have moved forward, or moved forward at scale, in the absence of the governments’ intervention (OECD 2015).

This definition of additionality is comparable to the concept of additionality of activities under the CDM. In its 2016 survey, the OECD (2018b) however just assumed full causality of certain public interventions, i.e. that the respective investments would not have occurred at all without public intervention. This illustrates the challenge of implementing such concepts in practice. OECD had to exclude reporting on mobilized private finance in its latest climate finance report due to a lack of reported numbers (OECD 2018a).

A group of multilateral development banks (MDBs) has also published their common definition of mobilization, which differentiates between direct mobilization through active involvement of an MDB in bringing in private sector actors and indirect mobilization through private co-financing in activities where an MDB is providing finance to a project pushed by private actors (MDBs and DFIs 2018). While this definition applies to the accounting of all development assistance, it is also applied in climate finance reporting of MDBs (MDBs 2018).

In absence of international rules in this regard, we will apply in our analysis a conservative definition of *climate* finance as net financial support provided to developing countries, while *climate-compatible* finance describes all gross flows.

3.2. Treating market mechanisms in the accounting for mobilized private climate finance

How are private sector investments under market mechanisms treated in the context of Article 9 related reporting requirements? Should private mitigation investments triggered by revenues from credits under market mechanisms count as mobilized private climate finance or not? As we have seen above, private demand for CDM credits was mobilized by public policy, e.g. by the eligibility of CDM credits in the EU ETS. Should there be a difference to discussions relating to Article 2.1c?

In our view, financial flows generated by ITMO transfers must be accounted for differently towards goal 2.1c and Article 9. Payments made for carbon credits for any purpose can be seen as a redirection of finance towards low-carbon and climate-resilient development in line with Article 2.1c (under condition of a robust operationalization of the underlying mechanisms). This applies also to voluntary payments for carbon credits by private entities driven by considerations of corporate social responsibility (Stadelmann et al. 2013).

However, if these payments for credits are made by public or private entities to comply with the mitigation commitments under the NDC of the respective Party to the UNFCCC, either directly or through an intermediate policy instrument at the domestic level, they can no longer be accounted as (private) *climate* finance to support developing countries in line with Article 9. If the buying Party however cancels the credits acquired in the context of results-based climate finance they can be accounted for under Article 9.

As per agreement between the cooperating Parties, the host country could either use the generated credits towards its own NDC and would not undertake any corresponding adjustment, or, the credits generated would be cancelled in an effort to contribute to “overall mitigation of global emissions”. In the latter case, the host country would need to undertake corresponding adjustments.

Table 1: Accounting for payments for ITMOs in different scenarios

Buyer of credits	Progress on 2.1c	Progress on Art. 9 commitment of buying country	NDC implementation of the host country	NDC implementation of the buying country
Public for compliance	Yes	No	No	Yes
Private for compliance	Yes	No	No	Yes
Public for RBCF ¹	Yes	Yes	Yes	No
Private for voluntary action, mobilized by public action ¹	Yes	No	No	Yes ²
Private for voluntary action, in absence of public action ¹	Yes	No	No	No

¹ Requires credit cancellation

² For modalities of accounting for voluntary carbon markets under the Paris Agreement and associated changes in claims of emission reductions, see chapter 4.3

Source: Authors

4. Setting Article 6 rules to enable private finance mobilization

Key messages:

- Private sector participation in market mechanisms will be the higher, the lower transaction costs (including taxes), the lower government interference, the broader the scope of eligible activities and the more lenient baselines and additionality determination. There is a clear tradeoff with environmental integrity regarding the first and the last points that needs to be addressed by regulators. Negotiators need to see where to position themselves regarding this tradeoff.
- Article 6 mechanisms are likely to have stronger government involvement than the CDM, which may reduce private sector engagement.
- Some activity developers’ trust in the long-term stability of Article 6 mechanisms will be reduced if registered CDM projects and credits cannot be transitioned into Article 6.

At COP24, the Parties to the UNFCCC were unable to agree on the operationalization of Article 6 of the PA. While the ultimate failure is mainly being attributed to the issues of CDM transition and accounting for A6.4ER transfers, the negotiations were unable to resolve a broader set of issues central to the environmental integrity and robustness of the mechanisms. 2019 therefore is a crucial year of negotiations as the finalization of the rulebook is necessary to ensure the implementation of cooperation mechanisms in the first NDC commitment period (Michaelowa 2018).

This prolongation of negotiations on Article 6 also means Parties can still assess the current status of texts, clarify concepts presented therein and close potential loopholes. It is also an opportunity to assess the impact of the rules as currently foreseen on the mobilization of the private sector in mitigation activities. In this regard, the fundamental question of analysis in this chapter relates to what rules, modalities, procedures and guidelines are needed in the rulebook for Article 6.2 and Article 6.4 to allow for significant mobilization of private sector finance (see Table 2).

Table 2: Research questions on rules for Article 6 conducive for private sector participation

1. Creating a framework conducive for private sector engagement
<ul style="list-style-type: none">• Defining the role of the private sector in the governance framework of both cooperative approaches and the centralized Art.6.4 mechanism• Reducing private sector transaction costs without threatening environmental integrity
2. Incentivizing up-scaled supply of mitigation outcomes while preserving environmental integrity
<ul style="list-style-type: none">• Preserving trust in market-based mechanisms through a transition of CDM and JI• Defining the scope of activities eligible for crediting• Setting robust baselines while striving for standardization• Determining additionality of activities in the context of the NDCs• The impact of taxes on market mechanisms - share of proceeds and overall mitigation
3. Allowing for enhanced private sector demand beyond NDCs

The operationalization of the framework and work-programme for non-market approaches (NMAs) under Articles 6.8 and 6.9 is not considered in this analysis. The decisions on the framework and work-programme are likely to establish a very broad mandate for the work programme and its role for mobilizing private finance will depend on its implementation by the Parties. Therefore, NMAs are excluded in this chapter, but considered in chapter 6.

In our analysis we concentrate on the *short term*, meaning on the current status of negotiations with the perspective to conclude them at COP25. The negotiations on Article 6 will continue on the basis of two texts: the draft version of the Subsidiary Body for Scientific and Technological Advice (SBSTA) as submitted to the Conference of the Parties serving as Meeting of the Parties to the Paris Agreement (CMA) on December 8th as well as the latest iteration of the text prepared by the Presidency in the “Katowice text” on December 14th (referred to as “Presidency text” hereafter). Therefore, both texts will be taken into account in the following analysis and where there will be significant differences between both versions, this will be made explicit. While we hope that our assessment of current texts is helpful, we are aware that the principle of negotiations “nothing is agreed until everything is agreed” applies and that the current versions of text may change substantially in the last round of negotiations.

It is clear that the full operationalization of both Article 6.2 cooperative approaches as well as the Article 6.4 centralized crediting mechanism will require further work to be undertaken under SBSTA, by the UNFCCC Secretariat as well as the Supervisory Board of the Article 6.4 mechanism. Eventually, the degree of mobilization of private finance will strongly depend on this technical work, as has been the case under the Kyoto Mechanisms. For instance, the specific requirements on baseline setting and additionality testing, but also the administrative procedure will determine the level of transaction costs for the private sector. In this short term perspective, we focus on the high-level issues of negotiations that are still contentious or unclarified. We assume that at this stage of negotiations, Parties will hesitate to re-open issues where an agreement had been reached at COP24, even if this cannot be excluded. Even if “nothing is agreed unless everything is agreed” we consider the following key features of both Article 6.2 guidance and Article 6.4 mechanism to be likely to be agreed as such:

- The Article 6.2 guidance on bilateral ‘cooperative approaches’ will focus on the accounting for ITMOs. Article 6.2 governance will be assured through a reporting and review process and a centralized Article 6 database. Corresponding adjustments will be recorded and must be done on the basis of both NDC and GHG inventory or a reference value expressed in a non-CO_{2e} metric. Parties will have to demonstrate their capabilities to conform with the reporting requirements to be eligible to participate in cooperative approaches (SBSTA 2018a, UNFCCC 2018e).
- Article 6.4 governance will be executed by the Supervisory Board. Any activity will require host country approval and undergo an activity cycle from project design, validation, registration, to monitoring and issuance. Activities will have to conform with the methodologies approved by the Supervisory Board. The issuance of units, the so-called “A6.4ERs” will be subject to share of proceeds (SBSTA 2018b, UNFCCC 2018e).

The most contentious issues still open in the negotiations are shown in Table 3 below:

Table 3: Contentious issues in Art. 6 negotiations

Highly contentious issues:
<ul style="list-style-type: none">▪ The eligibility of crediting mitigation activities not covered by the targets or sectors of host countries' NDCs
<ul style="list-style-type: none">▪ Allowing for others uses of A6.4ERs and ITMOs than NDC implementation
<ul style="list-style-type: none">▪ The triggers of corresponding adjustment<ul style="list-style-type: none">• The application of corresponding adjustment following transfers of mitigation outcomes achieved in sectors or regarding gases not included in the host countries NDC• The application of corresponding adjustments to the first transfer of A6.4ERs by a host country
<ul style="list-style-type: none">▪ The expansion of share of proceeds to ITMO transfers under Article 6.2
<ul style="list-style-type: none">▪ The transition of units, activities, methodologies and standards from the Kyoto mechanisms (CDM and JI).

Less contentious, but highly complex

- Preserving environmental integrity through mechanism design
- Setting baselines and determining additionality in the context of NDCs
- Reconciling the use of different metrics in accounting for transfers against NDC targets and ensuring the compatibility of units that are traded in different metrics
- The basis of corresponding adjustments in the context of different types of NDCs, in particular single- year and multi-year NDCs.

The following analysis will focus on the issues that are likely to have the highest impact on private sector participation. Therefore, accounting will not be as central to our analysis as it is to the current round of negotiations. Accounting is only relevant in the context of private sector participation in so far that it is robust and minimizes environmental integrity risks. Core aspects that we do consider are issues that determine the role the private sector can play per se under both Article 6.2 and 6.4 and that are reflected in the draft text of negotiations after COP24. These are in particular:

- The role of governments in allowing and fostering private sector participation
- The transaction costs that arise from the rules and an eventual taxation or discounting for overall mitigation of global emissions
- Potential restrictions of eligible mitigation activities both regarding scope and technology, with the resulting repercussions on credit supply
- The way baselines and additionality are determined.

4.1. Creating a framework conducive for private sector engagement

Defining the role of the private sector in the governance framework of both cooperative approaches and the centralized Art.6.4 mechanism

While the Article 6.4 mechanism will be governed under the auspices of the UNFCCC, cooperative approaches will be designed and implemented through bilateral or multilateral cooperation. The role private sector can play in cooperative approaches will therefore be determined by the participating Parties and not in the negotiations on the Article 6.2 guidance. As per the current versions of the texts, authorization of private sector participation in cooperative approaches is to be made public if the resulting ITMOs are not transferred between governments but are instead acquired by private entities and used for another purpose than NDC achievement. However, allowing the use of ITMOs for other purposes is a bracketed provision in both versions of the negotiation texts. The independent verification of emission reduction through independent third-party verifiers is not mandated in the Article 6.2 guidance, even if this could strengthen the role of independent expertise. We would strongly suggest a requirement for third-party verification.

In the context of the Article 6.4 mechanism, private sector participation is likely to take similar forms as under the CDM, but government engagement is likely to be stronger, which may restrict private sector appetite to engage. Alternatively, this could also mean that governments take a more active role in mobilizing the private sector engagement in Article 6 activities, for instance through public-private partnerships. In general, activities can be developed and submitted for validation by private sector entities, if they have obtained the authorization of the host country. The authorization itself will however be dependent – in difference to the activities under the CDM – on the role of the proposed activity and the concerned sector in the NDC of the host country. Whether A 6.4ERs could also be acquired by private sector entities is however, as under Article 6.2, still a contested feature (see chapter 4.3 for a more detailed discussion). Auditors will play a role as “designated operational entities” in validating proposed activities and verifying the emission reductions achieved. As under the CDM, consultants can also play a role in developing methodologies and submit them to the Supervisory Board for approval. We would propose an approach very similar to the CDM which has proven functional and conducive to private sector participation over a long period.

In the current versions of the negotiation texts, there are provisions to limit transfers of mitigation outcomes in addition to restrictions related to environmental integrity in baseline-setting and additionality determination (see chapter 4.2). The discussion of limits to transfers is being held with regard to the Article 6.4 mechanism, as it remains unclear if ITMOs will be tradable ‘units’ that could change ownership in a secondary market. Quantitative limits to international transfers are being proposed by several Parties to address environmental integrity concerns but also to pursue other policy objectives, such as to limit the transfer of hot air, reduce disincentives for transferring countries to increase ambition in future NDC, address the risk of ‘overselling’ and ensure the ‘supplementarity’ of the use of market-based mechanisms for NDC achievement (La Hoz Theuer et al. 2019). Absolute limits on the quantities of emission reductions pledged for in the NDC that can be achieved through the acquisition of ITMOs will limit the role of the international market-based mechanisms and therefore, of private sector involvement in this context. Simultaneously, safeguarding the mechanism from ‘overselling’ or introducing a seller liability to the mitigation outcomes exported is important to reduce the risk for project developers that the license to export ITMOs may be withdrawn ex post as the host country realizes it needs the mitigation outcomes for own compliance (EBRD 2017).

It needs to be assessed whether it is preferable to implement such safeguards through absolute limits or through careful setting of baselines and testing of additionality of action. An absence of safeguards in this regard could be a source of insecurities for project developers similar to that that plagued JI in its early years. Overall, private sector participation will be reduced if limits are introduced, given that limits lead to an uncertainty whether an activity will generate credits.

Some of the proposed limits in the negotiation text would even directly impede the development of a fungible market for the trading of units. The negotiation texts include a mandate for SBSTA to develop safeguards to “avoid significant fluctuations in prices, quantities and speculative transfers of A6.4ERs in the international market” as well as to “restrict secondary transfers of A6.4ERs”.

Also, adopting an increasing share of proceeds at every transfer of A6.4ERs would limit the fungibility of the units (SBSTA 2018b, UNFCCC 2018e). These provisions would limit the profitability of trading A6.4ERs for intermediaries. A market with limited fungibility and liquidity will lose attractiveness for private sector participation, as shown in a number of domestic emissions trading systems.

Reducing private sector transaction costs without threatening environmental integrity

Private sector participation in both cooperative approaches and the Article 6.4 mechanism can be enhanced by reducing the associated transaction costs of involvement for project developers and implementing entities. The lower the transaction costs, the lower the entry barriers for private sector participants will be. Transaction costs should also be kept low for non-governmental entities interested in purchasing and using achieved mitigation outcomes. In general, transaction costs associated with the generation of ITMOs or A6.4ERs will be higher if the rules for methodology development, additionality and MRV procedures are set more stringently (which strengthens environmental integrity) and associated taxes (including the “share of proceeds”) to pay for administrative and adaptation purposes is higher. Furthermore, the complexities of associated administrative procedures, the time needed to undergo a full activity cycle and the fees associated with this process will add to the expenses participating entities will need to shoulder when engaging in Article 6 transactions.

To facilitate the participation of the private sector in Article 6, the new market mechanisms should learn from the lessons generated in the context of the Kyoto mechanisms and build on the capacities actors have built since the inception of the carbon markets. These include:

- Standardizing baseline setting, additionality testing and MRV procedures. This does not only reduce transaction costs regarding data requirement and methodology development, but also increases objectivity. If standardization is done according to conservative assumptions environmental integrity will be enhanced. However, standardization is not appropriate for all sectors and technologies (see discussion in Schneider et al. 2012 and in section 4.2 below). Here, more research is required to derive recommendations when standardization is appropriate and when not.
- Streamlining supervisory body and host country approval processes, for example through electronic submission templates and maximum time periods for regulatory decisions.
- Harmonizing rules and infrastructure wherever appropriate between cooperative approaches and the Article 6.4 mechanism (EBRD 2017). In this context, a significant increase in transaction costs for the private sector, in particular for intermediaries and buying entities, would be the trading of units in different metrics, with a seemingly equal metric being expressed in slightly different ways. For example, metrics for A6.4ERs in renewable energy capacity would have to be defined and approved by the CMA, whose definitions could be slightly different from that of Art. 6.2 renewable energy capacity ITMOs defined by specific countries. Such “shades of metrics” could result in uncertainties about the underlying quality of the units and the necessity of methodology development for the conversion between metrics. A high degree of harmonization would therefore both reduce transaction costs and safeguard environmental integrity of ITMOs. The impact of differences in metrics on transaction costs needs to be studied more closely.

4.2. Incentivizing up-scaled supply of mitigation outcomes while preserving environmental integrity

Preserving trust in market-based mechanisms when designing the transition of CDM and JI

The Kyoto mechanisms, in particular the CDM, have proven the ability to mobilize private sector action at scale. However, the CDM lost international support due to criticisms regarding the additionality of registered activities, limited contribution to sustainable development co-benefits, inequitable regional distribution and administrative complexities. In reaction to these developments, the CDM has undergone a lengthy reform process, where transaction costs were reduced substantially through introduction of standardized baselines, streamlined procedures for small and micro-scale projects including the use of positive lists for additionality determination and regional distribution rebalanced, especially through an increase of programmatic activities. Not all reforms have unequivocally improved the environmental integrity of the mechanism, and a thorough assessment of their respective impact should be undertaken.

The transition of Kyoto units, activities, methodologies and standards is currently one of the key contentious issues of the negotiations, the outcome of which will have implications on the willingness of the private sector to engage in future mechanisms. Many project developers and buyers of CDM credits have stated that they would lose trust in the new mechanisms if registered CDM activities and issued credits cannot be transitioned into Article 6. There are many considerations against and in favor of a CDM transition which cannot be discussed in detail in this report and which would warrant a separate study. The transition of methodologies for baseline setting and MRV - which have been developed with an investment of over 20 million € - as well as the transition of accreditation standards is less contentious in negotiations. Private sector activity developers and consultants have stressed that this would allow to continue to use human capacities that have been built in the past.

Defining the scope of activities eligible for crediting

Whether mitigation activities should be eligible if implemented in sectors not covered by the NDC is another key element in the ongoing negotiations on Article 6. On the one hand, mitigation in sectors outside the NDC would be additional to the host country efforts and constitute the biggest potential for mitigation to be credited. It would essentially be akin to a continuation of the CDM; and the private sector would certainly be in favor of having access to mitigation activities outside of the NDC. On the other hand, it sets a perverse incentive for host countries not to expand the coverage of the NDC over time, an issue which also plagued the CDM and which was only partially resolved by the "E-"-rule that stated that new mitigation policies would not be taken into account in additionality assessment of CDM activities. This issue is currently being negotiated in the context of whether corresponding adjustments will have to be applied by the host country when mitigation outcomes of these sectors were to be transferred.

In the scenario where a target sector is not included in the NDC, it is currently unclear to what emission targets a corresponding adjustment would be applied to. Host countries could have two options to follow in this case:

- The first option would be to include the sector in the NDC under a BAU-scenario (NDCs can be updated at any time) and then make a corresponding adjustment to the respective NDC target for the sector.
- The second option would be to apply a corresponding adjustment to another sectoral target of the NDC. In this case, the achievement of the other sectoral target would become more difficult. This could be deemed unjust and would be a massive disincentive to the use of market mechanisms. Not applying a corresponding adjustment however could set perverse incentives not to expand coverage of the NDCs in the long term.

Under Article 6.2, crediting outside of the NDC could be seen as particularly challenging, as there are will likely be no detailed rules on baseline setting and additionality testing that could limit the risks to environmental integrity. Under Article 6.4 it could be allowed even in the absence of corresponding adjustments if the rules for baseline setting and additionality testing are sufficiently stringent. It would also offer some opportunities to scale-up supply in A6.4ERs at least in the first NDC implementation cycles when coverage of many NDCs will not yet be economy-wide due to capacity constraints.

Setting robust baselines while striving for standardization

Standardization of elements for baseline setting reduces uncertainties for project developers regarding additionality and baseline assessment. Standardized baselines, performance benchmarks or positive lists are easily replicable and facilitate the implementation of scalable activities (EBRD 2017). However, experience from the CDM has shown that there are limits to the use of benchmarks (Schneider et al. 2012). Positive lists can become “sticky” over time, not being adjusted when costs of technologies have fallen to make them non-additional.

There are two key differences with regard to Kyoto mechanisms that must be considered when developing the rules for the Paris mechanisms: first, crediting will be likely eligible at a sectoral level or for policy instruments and secondly, baselines will need to be formulated in relation to the host country’s NDC in order to prevent the risks of overselling of emission reductions.

In the negotiation texts on Article 6.2, principles related to baseline setting are only included in the reporting requirements. Parties shall justify that baselines in cooperative approaches are set in a conservative way and below BAU scenarios. It is added that baselines should take into account all existing policies and address potential leakage. This does however not establish a reference to the NDC. Developing robust rules for baseline setting while limiting transaction costs under Article 6.4 is however likely to have an impact on the design of cooperative approaches as Parties could choose to rather base their approaches on approved methodologies rather than engaging in the resource consuming effort of developing independent ones.

The Presidency text on Article 6.4 contains a menu for baseline setting approaches that constitutes an attempt to reconcile different approaches and stringency levels. As default approach, baselines would be set following a best available or performance-based approach. Performance based approaches do represent a rather high level of standardization but are also difficult to adapt to different national circumstances. Therefore, the negotiation text also adds that the following criteria should be taken into consideration:

- Available technologies that are both environmentally and economically attractive. However, there is no clear definition of the environmental and or economic attractiveness of technologies nor the ranking of priorities in case of trade-offs between both principles. Proving the “attractiveness” of a technology in the absence of clear established criteria of the Supervisory Board could prove to be complex
- The emissions of activities providing similar outputs and/or services in similar social, economic, environmental and technological circumstances
- Barriers to investment
- A contribution to the reduction of the emission levels of the host country.

The last condition for baseline setting refers to the fundamental question of how to take into account host country NDC achievement in baseline setting (PMR 2017). The wording in the text seems to imply the following alternative implications:

- (a) All emission reductions shall be credited but a part of the emission reductions should be attributed to the host Party. In case the share of mitigation outcomes needed for NDC achievement would only be determined ex-post, this could be a source of insecurities for project developers.
- (b) The baseline should be set at levels below NDC targets, so that only additional emission reductions would be credited. This would, however, require a quantification of NDC targets (that might be also required in the context of additionality testing).

It remains unclear whether the baseline would only have to consider unconditional NDC targets or also targets included in the NDC but conditioned on the provision of international support. The conditionality of targets is not addressed in the current versions of negotiation text but might significantly alter the definition of additionality and the establishment of baselines (PMR 2017).

Furthermore, in case a best available technology or performance based approach would not be considered “appropriate”, baselines could also be set with regard to a BAU scenario or even with regard to historic emissions. Historic emission scenarios tend to be conservative as most countries have an increasing BAU emissions path, which, in particular with regard to developing countries, might not be reconcilable with the development needs of the economy. Setting BAU scenarios would not safeguard the host countries from the risk of overselling if they have ambitious NDC targets.

Most importantly for the private sector, it should be determined who will be able to assess the “appropriateness” of setting the baseline and the underlying criteria for assessment. Will BAU and historic emission baselines be applicable in sectors not included in the NDC or in Least Developed Countries (LDCs) and Small Island Developing States (SIDS)? This should be clarified in the negotiation text in order to reduce uncertainties for the project developers. The exemptions from the default option should be restricted in order to ensure the comparability of issued A6.4ERs through the mechanism.

The Presidency text indicates that the UNFCCC Secretariat might develop standardized baselines at the request of the host Party at the highest level of aggregation possible. If this was a service provided by the Secretariat, it might increase the administration costs significantly, but it would also lower the barriers for countries and project developers to engage in upscaled crediting approaches.

Determining additionality of activities in the context of the NDCs

Additionality of activities in relation to what would otherwise occur is a concept inherited from the CDM. This concept has undergone some reforms under the mechanism. In the beginning, additionality was assessed through an ill-designed barrier test that led to the registration of many non-additional projects in the “gold rush” period. In reaction, regulators replaced the barrier test by an investment test that was refined over time and standardized to some extent with the introduction of default values for key parameters (Michaelowa 2009). While more robust now, additionality assessment procedures have been criticized as being too complex and generating overly high transaction costs for project developers. With the decline of prices in the CDM market, regulators have tried to reduce transaction costs to “save” the remnants of the markets through defining automatic additionality for activities below a certain size or belonging to a positive list.

Such standardized approaches could benefit private sector participation in new market mechanisms, as they increase the objectivity of the additionality assessment and reduce the risk of uncertainty. For the operationalization of Article 6, it is however important to develop a concept of additionality that is also applicable to up-scaled interventions, including mitigation policy instruments. While under the CDM and JI, national policies were not eligible for crediting, it becomes relevant under Article 6 to understand when a policy instrument is additional (Michaelowa and Butzengeiger 2017).

In the Presidency text on Article 6.2, there is no reference being made to additionality. It could be argued that participating Parties would ensure crediting for additional emission reductions, as anything else would mean a waste of resources. It is also in the interest of the host country as selling non-additional emission reductions can put the NDC achievement at risk: if ITMOs not backed by real emission reductions would be transferred out of a host country, it would make the achievement of (ambitious) NDC targets more difficult (Michaelowa and Butzengeiger 2017).

However, NDCs of the host Parties may also generate “hot air”, in which case an activity-specific additionality test is necessary to prevent that the “hot air” is transferred throughout the Paris system. This is not a theoretical issue, as it has happened under the Kyoto Protocol when the Ukraine and Russia generated hundreds of million JI credits in a few weeks in late 2012. Looking at the current baselines in NDCs, crediting against overstated baselines is a real risk (Schneider et al. 2017).

In the Presidency text on Article 6.4, additionality is now defined as twofold:

- (c) Emission reductions achieved by the activity are additional to any that would otherwise occur, taking into account all relevant national policies, including legislation
- (d) Emission reductions are complementary to the policies and measures implemented to achieve the NDC of the host Party.

Again, there is no clear understanding of how to treat conditional NDC targets. Unconditional policy interventions are non-additional, as already planned in order to achieve NDC. Conditional targets could however be deemed as additional to the NDC. However, standardization of additionality assessment could be encouraged in the rulebook in order to reduce the transaction costs for the private sector. Overall, with regard to additionality determination, regulators need to find a fine balance between sufficient environmental integrity from the start also to prevent scandals and scathing criticism by media and NGO that eventually wrecked the CDM market despite a lengthy reform process, and sufficient attractiveness of the market mechanisms for private sector engagement.

The impact of taxes on market mechanisms - share of proceeds and overall mitigation

When discussion ‘taxes’ in the context of this report, we refer to both the share of proceeds that will be applicable under Article 6.4 (and possibly Art. 6.2) as well as a reduction of ITMOs/A6.4ERs due to the principle of overall mitigation of global emissions. Obviously, private sector participation will be negatively impacted by any taxes, however, the importance of these barriers depends on their relation to the profits achieved.

Under the CDM, project developers paid registration and issuance fees as “share of proceeds” for the administrative costs to the UNFCCC Secretariat and an in-kind tax of 2% of issued credits to a holding account for the Adaptation Fund. Under Article 6, a share of proceeds for both administrative and adaptation purposes is foreseen for the Article 6.4 mechanism. Several Parties, in particular the African Group of Negotiators, push for the share of proceeds to also be introduced for cooperative approaches under Article 6.2. Under the CDM it has especially been the administrative fees that burdened project developers in times of dwindling market prices for CDM credits. This resulted in less issuances and in some cases in the discontinuation of the CDM activities.

When operationalizing the share of proceeds under Article 6.4 (and potentially Article 6.2), the effect of monetary fees that come at a fixed price versus in-kind contributions should be considered. However, the share of proceeds for administrative purposes are also important to secure the independent financing of the mechanisms, which is crucial to its stability and therefore in the interest of the private sector. It can also serve as a threshold to ensure that the activities submitted under Art. 6 are serious.

“Overall mitigation for global emissions” (OMGE) has been interpreted differently by the Parties in the negotiations. While some see it as a principle linked to the conservativeness and environmental integrity of the mechanisms, others understand it as a cancellation or discounting of some of the emission reductions achieved that cannot be claimed by any participating Party but is to the benefit of the atmosphere. In the Presidency text, OMGE is only presented as a voluntary measure. Even if introduced as obligatory feature again, it can be operationalized in a way to not impact the supply side, but the buying and acquiring side through introducing the cancellation/discounting of credits not in the moment of issuance but at the moment of use against NDC or other purpose (EBRD 2017). Another option that would not negatively impact on the private sector but require public budget would be to use results-based finance to acquire and cancel ITMOs/A6.4ERs.

4.3. Allowing for enhanced private sector demand beyond NDCs

Market demand will depend mostly on the level of ambition of programmes and policies from countries and their use of international market mechanisms to save costs and scale-up mitigation (see chapter 5). The negotiations on the rulebook however can ensure that the potential of additional voluntary demand from private sector entities not covered by NDCs - due to corporate social responsibility considerations (Hermwille and Kreibich 2016) - or non-UNFCCC mechanisms such as CORSIA is not curtailed. This relates to the provisions regarding other uses of ITMOs/credits beyond NDC fulfilment.

Under both Article 6.2 and 6.4 texts, authorizing the use of ITMOs or A6.4ERs for other purposes than NDC achievement is a bracketed provision. The key contentious question is the requirement to undertake corresponding adjustments in such case. One could argue, that if a credit is not used against any other Party's NDC, no double counting would occur. However, this would infringe upon the principle of “overall mitigation” as de-facto emission reductions would be claimed twice, even if under different accounting frameworks. Therefore, it will be important to ensure that the host country undertakes corresponding adjustments in a scenario when units are used for other purposes. In any case, the possibility of alternative uses of ITMOs or A6.4ERs would be beneficial from the private sector perspective as it would broaden the route to market for generated mitigation outcomes. This impact of increased confidence needs to be considered by negotiators when finalizing the Article 6 text in the Paris rulebook.

5. Incentivizing private sector participation in Art. 6

Key messages:

- National level policies, particularly carbon pricing, and the acceptance of ITMOs/A6.4ERs against such policies, are crucial incentives for private sector activities under Art. 6. They are also key to mobilize the willingness of financial institutions to provide loans for such activities.
- Accepting Art. 6 units will lower the revenues from national carbon pricing policies. Limiting eligibility to certain transferring countries or technologies, or to a certain percentage of the obligation has widely been used to protect revenues, but reduces the incentive for the private sector.
- A range of countries including several developing ones already accepts units from international market mechanisms, but the total demand volume generated is still much less than demand from the EU for CDM credits prior to 2013.
- The voluntary carbon market is likely to shrink as a demand source due to government “appropriation” of emission reductions under NDCs.
- National level policies can be used to mobilize private sector mitigation that can then generate ITMOs to be sold by the government. The government could retain the revenues to cover costs of “carrot”-type policies while it could pass on the revenues to private sector entities mitigating emissions under a “stick” type policy like a carbon tax or mandatory standard.

This chapter discusses the design of incentives for the private sector to participate in Article 6 activities, be it as a (co-) financier, project developer, or buyer of generated ITMOs/A6.4ERs (see Table 4 below).

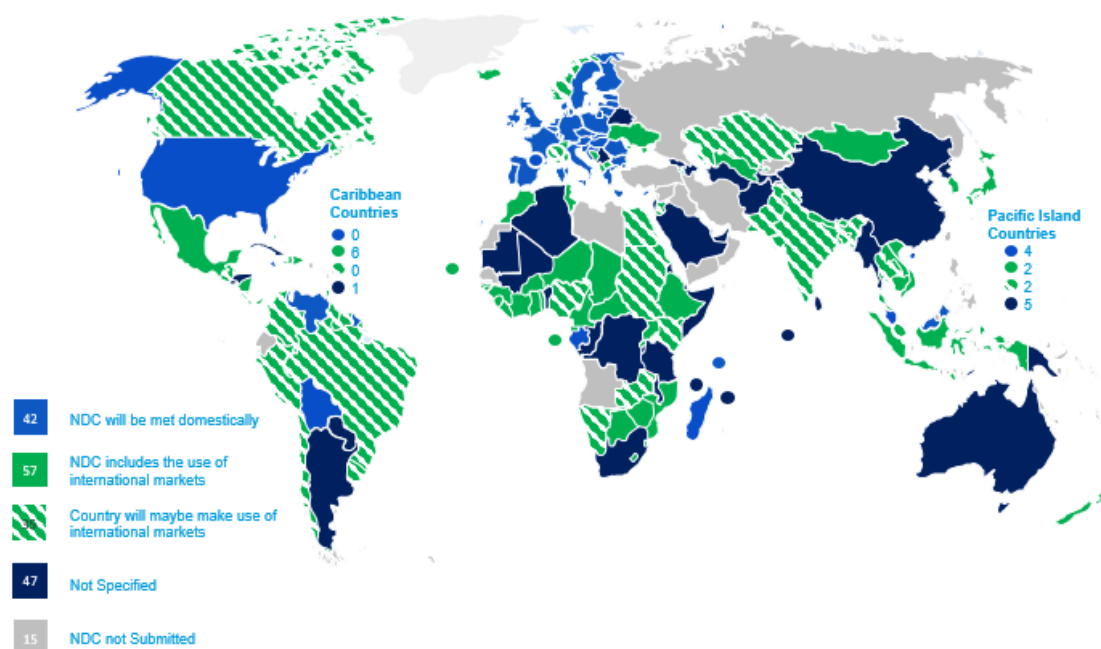
Table 4: Research questions on incentives for private sector entities to participate in Article 6

1. Demand side considerations
<ul style="list-style-type: none">• Policy instruments to generate private sector demand on the national and international level• Case studies on national and international policy instruments generating demand for international carbon credits• Generation of voluntary demand from private sector entities
2. Supply side considerations
<ul style="list-style-type: none">• Influence of the scale of Art. 6 action on private sector supply of ITMOs• Policy instruments that can serve as incentives for private sector mitigation• Parameters affecting private sector supply of ITMOs• On the choice of national policy instruments to effectively and efficiently incentivize private sector supply• The impact of taxes on market mechanisms - share of proceeds and overall mitigation
3. Transversal considerations
<ul style="list-style-type: none">• What relevance has the provision of services related to carbon market activities in relation to the actual mitigation activities themselves?

5.1. Demand side considerations

Governments can directly acquire ITMOs / A6.4ERs for compliance with their NDCs (see Figure 2 below showing countries that have indicated in their NDC that they want to use market mechanisms).

Figure 2: NDCs and reference to the use of market mechanisms



Source: IETA (2018)

Sources of demand from the private sector for ITMOs/A6.4ERs can originate either from obligations under national legislation, such as cap-and trade schemes, carbon taxes or regulation allowing use of Article 6 units. This section presents the current demand landscape for carbon credits from both sources and discusses future demand for ITMOs / A6.4ERs.

Policy instruments to generate private sector demand on the national and international level

There are various ways in which policies and regulations trigger active participation in carbon markets. National mitigation policies, especially carbon pricing instruments, can include an option for the regulated private sector entities to acquire certain types of carbon credits to offset against the obligations of the instrument. Carbon tax legislation introduced in countries like Mexico and Colombia presents a precedent. Carbon pricing introduced through emission trading schemes on the basis of absolute (e.g. the EU-ETS) and intensity-based emission targets are another example of policy instruments where carbon offsetting can play a role.

Other cases where such linkage can be established include fuel characteristics or efficiency regulations and buildings or appliance efficiency standards. The EU Fuel Quality Directive (EU FQD) is one such example (see below). Finally, baseline and credit systems such as those introduced by the international aviation industry under CORSIA scheme are approaches that can leverage new sources of demand for carbon offsets.

Furthermore, dedicated policy instruments such as tax concessions, access to concessional loans or direct financial assistance can be used to increase the revenues from the sale of carbon credits (Michaelowa et al. 2018).

Besides going indirectly through policy instruments, governments can set up carbon funds for direct credit acquisition. This was widespread under the CDM, and an example of a jurisdiction currently following a similar path is the Australian government, which through the Australian Emission Reduction fund sources carbon offsets from the private sector through reverse auctions.

Making Article 6 credits (ITMOs or A6.4ERs) eligible as offsets under such national level policy instruments is critical to enhance demand and support the development of the market mechanisms under Article 6. Private sector entities would acquire offsets as long as their prices are lower than the domestic price /carbon tax rate. Given that offset supply is global, the likelihood is extremely high that this will be the case. The eligibility to use offsets would lower the costs for domestic companies to reduce emissions and comply with regulation, in particular in sectors exposed to global competition. At the same time, allowing for offset use lowers revenues from domestic carbon pricing, be it cap and trade systems with auctioned allowances or carbon taxes. Policymakers thus need to carefully balance the policy targets of generating domestic revenues and achieving low mitigation costs. Historically, such balance has been difficult to achieve, leading either to unfettered offsetting or a protectionist approach allowing very limited offsetting to avoid “outsourcing” of emissions reductions. This is unfortunate given the possibility for national policy makers to apply targeted eligibility criteria regarding technologies, host countries or sustainable development co-benefits to link offsetting to other policy objectives in international cooperation.

Case studies on national and international policy instruments generating demand for international carbon credits

We provide examples of national and international policy instruments that enable obligated entities to partially or fully meet compliance targets through the purchase of carbon credits. The cases presented here are the most interesting examples for the link of national policies to international markets currently implemented.

For all of the case studies below – except Australia’s Emission Reduction Fund – international credits from the CDM can be used. It should be noted that several important policy instruments are introduced in developing countries, showing that these will generate demand under the PA. These case studies serve to showcase how policy makers could structure future policy instruments to trigger long-term demand for ITMOs and A6.4ERs from the private sector.

Regulation: The EU's Fuel Quality Directive (FQD) and Upstream Emission Reductions (UERs)

The 2015 EU Fuel Quality Directive (2015/652) obliges transport fuel suppliers to reduce the life cycle GHG intensity of their fuels by 6% from 2010 to 2020. To reach the 6% target, the Fuel Quality Directive (FQD) outlines a number of compliance options including allowing fuel suppliers to offset against the target, blend or supply biofuels, supply fuels with lower GHG intensity, or provide electricity for road transport (European Commission 2015, p.4).

Offsetting is permitted with so called Upstream Emission Reductions (UER). UERs are generated by projects from the oil and gas sector before the fuel enters the refineries. While CERs and ERUs from the Kyoto compliance markets, as well as emission reduction credits from other schemes, can be used as UERs, they have to comply with conditions that are specified in the FQD, and their cancellation has to be verified. The European Commission has published a non-binding guidance for implementation of the directive by EU member states. It specifies eligibility criteria and reporting obligations. Among all member states Germany is most advanced in implementing the FQD. Credits need to originate from projects that have been implemented after seeking approval by the German Emissions Authority and for which additionality can be proven. Germany is also the only country that has officially announced that the GHG intensity targets for fuel suppliers in Germany will continue beyond 2020 and that UERs can be used beyond 2020 as a compliance instrument (even if the FQD is not extended beyond 2020). The crediting period for projects generating UERs is only one year. Project proponents registering their upstream projects in Germany have to confirm that they will not use emission reductions from other crediting periods for other purposes. Also, the host country has to confirm that it is not accounting the UERs nationally (e.g. towards the NDC target).

Baseline and credit: CORSIA (international air traffic)

In 2016, the International Civil Aviation Organization (ICAO) adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). CORSIA aims to achieve carbon neutral growth in the international aviation sector post-2020, and has been established as an international scheme in order to avoid the need for existing and new carbon pricing instruments to be applied to international aviation emissions on a regional or national basis.

Under CORSIA, airlines need to fulfil their offsetting requirements in three-year compliance cycles beginning with a pilot phase with 79 countries in 2021. The scheme is expected to create an important source of demand for credits on carbon markets at least through to 2035. According to the International Air Transport Association (IATA) the scheme will generate demand for around 2.5 billion carbon credits between 2021 and 2035, averaging 164 million per year but ramping up slowly (Healy 2017, IATA 2019). This is also in line with the estimates presented by Schneider and La Hoz Theuer of 2.7 billion credits in the same period of time (Schneider and La Hoz Theuer 2017). Others have estimated demand to be as high as 4 billion credits by 2035 (IETA 2018). In March 2019, the ICAO Council adopted the eligibility criteria for the use of offsets under CORSIA, which defer much of the responsibility for ensuring the environmental integrity of CORSIA-eligible offsets to the credit standards.

The eligibility criteria consist of eleven criteria relating to the overall programme design requirements⁴, and an additional eight principles to ensure environmental integrity⁵. Carbon Market Watch (2019) finds that the existing carbon standards fail to meet all of these criteria.

Carbon pricing: Carbon tax in Colombia and Mexico

Carbon taxes can generate demand for offsets by allowing full or partial “offsetting” of the tax through credits. Both Colombia and Mexico have introduced carbon taxes with different options for “offsetting” emissions under the tax.

Colombia introduced a carbon tax applying to the sales and imports of all fossil fuels except for coal in 2016. The possibility to reduce tax liability by using offsets was introduced as complementary action (UNDP Vietnam 2018, p. 69). Under this regulation, entities that are certified as “carbon neutral” are exempt from the tax liability. “Carbon neutrality” is achieved when the total emissions generated by the fossil fuels covered by the tax are offset through the implementation of mitigation activities. The approval of projects is undertaken by the National Directorate of Taxes and Customs of Colombia according to the following eligibility criteria: (i) carbon credits must be registered after January 1st, 2010 on the Colombian territory (mitigation activities achieved outside Colombian territory were accepted until December 2017);(ii) must be in compliance either with CDM methodologies or be certified under a carbon standard that includes the verification from a third party accredited by the UNFCCC or the National Normalization Body, or (iii) be a project activity labelled as Reducing Emissions from Deforestation and Degradation (REDD+). In addition, the entities must request the exemption ahead of the tax compliance deadline, and present a voluntary cancellation certificate for each offset tonne of CO₂.

In Mexico, companies can use Mexican origin CERs to pay partially (up to 20%) the carbon tax in kind. The tax entered into force in 2014 under the general climate change policy and was set initially at around USD 3.5 /tCO₂e for all fuels except natural gas. In contrast to Colombia’s setup, in Mexico’s case the monetary value of the purchased carbon offsets is considered by the regulators, rather than the mitigation value (World Bank 2017), which takes away most of the incentive as the private sector actor could generate the same revenue selling the credit on the secondary market. The tax bill will thus be reduced only by the amount equivalent to the market value of each credit at the moment of payment.

⁴ These include: (1) Transparency on methodologies and protocols, as well as their development processes; (2) Definition and public disclosure activities’ scope consideration and eligibility criteria; (3) Offset Credit Issuance and Retirement Procedures; (4) Ensure identification and tracking of units; (5) Define and ensure the legal nature and transfer of credits; (6) Have in place validation and verification procedures; (7) Publicly disclosure of the program governance; (8) Transparency and Public Participation provisions; (9) Safeguard Systems; (10) Sustainable Development Criteria; (11) Avoidance of Double Counting, Issuance and Claiming (ICAO 2019).

⁵ In addition, offset credit programmes should deliver credits that represent emissions reductions that meet the following principles to ensure environmental integrity: 1. Are additional; 2. Are based on a realistic and credible baseline; 3. Are quantified, monitored, reported, and verified; 4. Have a clear and transparent chain of custody; 5. Represent permanent emissions reductions; 6. Assess and mitigate against potential increase in emissions elsewhere; 7. Are only counted once towards a mitigation obligation; and 8. Do no net harm (ICAO 2019).

Government credit acquisition fund: Australia's Emission Reduction Fund

The Australian government introduced the Emission Reduction Fund (ERF) as a voluntary climate policy instrument in 2014, framing it as an alternative to a “punitive” carbon tax (Michaelowa et al. 2018, p.28). The fund was equipped with A\$ 2.55 billion from 2018; in its 2019 budget the government announced to replenish the fund with a total of A\$ 2 billion over the next 15 years (Karp 2019; Australian Government 2019). Mitigation projects from a broad range of sectors can receive “Australian Carbon Credit Units” (ACCUs), issued by the Clean Energy Regulator (Australian Government 2019). International credits, however, are not eligible. The credits are either bought by the Australian Government through an abatement contract or can be sold to other businesses for the purpose of offsetting their emissions. The latter is linked to a safeguard mechanism that sets limits on the GHG emissions of large polluting businesses and covers the direct emissions of around 140 large businesses (Australian Government, 2016; McKenzie 2018). This is a purely domestic mechanism, but could be expanded to source international credits (which has actually been discussed by Australian politicians).

Until 2018, the scheme had auctioned reductions of 191.7 million tCO₂e, with 16% already implemented. However, the fund has been criticized for being ineffective, as emissions have increased in almost all sectors covered by the fund. Besides, the fund is blamed for applying too generous baselines (McKenzie 2018). Moreover, almost two-thirds of the pledged reductions come from vegetation protection projects, in which land owners are paid not to clear their land. These projects are contentious with regard to additionality, transparency, but also cost effectiveness (Michaelowa et al. 2018)

Generation of voluntary demand from private sector entities

In addition to compliance with legal requirements, voluntary demand for carbon credits currently also exists, driven mostly by corporative social responsibility considerations of corporate buyers (Hermwille and Kreibich 2016). However, the voluntary carbon markets' orders of magnitude have been smaller in size and volume, their prices have historically been lower than in compliance markets. Voluntary certification standards have evolved from almost no regulation in the beginning to an increasingly sophisticated, but highly fragmented framework (Benessaiah 2012). Since the price crash in the CDM market, carbon credits originating from high-quality voluntary carbon market (VCM) projects and programmes have traded at considerably higher prices than secondary market CERs. For example, land-use and household devices VCM projects achieved an average price of around USD 5 in 2016, compared to USD 0.50 in the CDM market (Hamrick and Gallant 2018).

The most popular (sub-)sectors in terms of traded volumes for the generation and transaction of VCM credits are (small-scale) renewable energy, community-based energy efficiency, forestry and land use (Hamrick 2017, Hamrick 2018). Most offsets are generated in Asia, mainly from renewable energy projects. Average prices, however, are higher for offsets originating from Africa and Latin America, which tend to be smaller in volume and deliver high social and environmental co-benefits (Hamrick and Galant 2017).

One of the dominant VCM standards today is the Verra/Verified Carbon Standard (VCS), which covers more than half of the offsets currently traded on the market, the share of which continued to increase up to about 70% until March 2018 (Hamrick and Gallant 2017, Hamrick and Gallant 2018). The VCS was one of the first movers in the VCM (established in 2005) and has positioned itself as a market leader; partly because VCS credits have been allowed for offsetting in the California cap-and-trade scheme. The VCS is followed by the Gold Standard, considered the premium VCM standard due to its strong emphasis of local stakeholder involvement and the creation of sustainable development benefits, with a share of around 20% of traded offsets. Other standards, such as Climate Action Reserve and the American Carbon Registry, are important regional standards but have much lower overall volumes of certified carbon credits.

Although the PA entails considerable uncertainty for the future design of voluntary markets, it has raised overall awareness and fostered the trend of companies including climate targets in their strategic considerations. With an expected increase in pre-compliance demand, its influence on voluntary demand is perceived as positive (Hamrick 2018; Hermwille and Kreibich 2016). Private sector initiatives, such as the Science-Based Targets initiative (SBTi) point to a complementary relationship between public and private climate action and encourage companies to set their own targets for renewable energy, transport, or overall emission reduction, compatible with the objectives of the Paris Agreement (SBTi 2019). Such considerations and initiatives are perceived by buyers and other carbon market actors as a potential source of demand for offset credits with high social and environmental benefits (Lang et al. 2019; Hamrick and Gallant 2017). However, to date such initiatives “offer little or no acknowledgement to corporations that [...] fund external emissions reductions through offsetting.” (Hamrick 2018, p. 15). The SBTi advises against counting offsets towards companies’ targets, but acknowledges that offsets might be used to achieve emission reductions that go beyond the target (SBTi 2018).

There is now an emerging debate about whether the VCM will wither away as countries now have to prioritize fulfillment of their NDC targets, and therefore all mitigation actions run the risk of becoming appropriated by governments under compliance policy instruments, or whether the VCM can retain a niche in harnessing mitigation in fields where government policy instruments do not have a reach. In late 2018, the International Carbon Reduction and Offset Alliance (ICROA) presented three scenarios how future voluntary action by non-state actors could enhance ambition while avoiding double counting:

1. The “contribution claim”: emission reductions financed by non-state actors contribute to the host countries NDC. The end-buyers claim changes from ownership of an emission reduction to the attribution of an emission reduction.
2. The “net-zero claim in regulated sectors”: emission reductions financed by non-state actors in regulated sectors inside the NDC can be used for offsetting by the non-state actor if a corresponding adjustment is applied to the host country’s NDC. In case the reductions originate from regulated sectors outside the NDC, the crediting baseline must be adjusted (in case this is permitted in the Paris rulebook).

3. The “net-zero claim in unregulated sectors”: emission reductions from unregulated sectors can be used for offsetting if they prove additionality.

(ICROA and IETA 2018).

Given that all these options reduce the incentive for private sector players to use the VCM, we do not expect it to play an important role as a demand source under Art. 6. However, some governments may opt to promote the “contribution claim” to mobilize private sector action in NDC achievement.

5.2. Supply side considerations

The supply of ITMOs by private sector actors depends on a range of factors. The first relates to the level of aggregation of Article 6 transactions: while project/programme based interventions can directly engage the private sector, upscaled approaches on a sectoral level require policy instruments for mobilization of private sector action. In the latter context, pull factors are policy instruments and supportive infrastructure at the national level in order to provide appropriate incentives to the private sector actors and investors involved. Both for the project/programme and the sectoral level, the absence of barriers generated by government bureaucracy is an important factor for private sector supply. In the context of Article 6.2, a tension between generating more supply and the environmental integrity of the supplied units may emerge. The government may also want to restrict supply in order to prevent a sale of “low hanging fruits” abroad.

In a first step of the analysis, we outline the influence of the scale of Article 6 action on private sector supply of ITMOs. For upscaled approaches on a sectoral level, the different classes of instrument and policy options at the national level are presented before the main parameters affecting private sector supply of ITMOs are discussed. In a last step, the efficiency and the appropriateness of the policy instruments to address these parameters and thus generate private-sector supply of ITMOs is discussed. This relates both to the nature of the incentive provided and the possibility to sell the resulting mitigation in form of ITMOs, which at least for Article 6.4 will depend on international regulation.

Influence of the scale of Art. 6 action on private sector supply of ITMOs

If voluntary cooperation takes place on a project/programme level and governments apply a “hands-off approach” – which might be the case if the mitigation is from sectors not covered by the NDC – Art. 6 transactions could evolve in a manner similar to the CDM where project owners would have the control over the use of ITMOs and resulting revenues, depending on the way governments authorize project owners. This would provide direct incentives for private sector supply. As long as the expected carbon revenues (benefits) are higher than the overall costs of the carbon asset development process of a mitigation project – including direct project costs as well as Article 6 related costs, as costs of transactions, MRV, auditing, etc. – there are incentives for the private sector to engage in market mechanisms and supply ITMOs.

However, given the implications of ITMO transfers on NDC achievement, host country governments are likely to strictly control the degree to which project/programme owners have the right to undertake ITMO transfers. Host country governments may thereby only agree to sell a portion of the ITMOs and appropriate the remainder for the fulfillment of their NDC. This would be somewhat similar to JI, where host countries' governments decided on the proportion of share of emissions reductions that can be credited and sold abroad and share of emissions reductions that are used for domestic compliance through different level of baseline stringency. Another way of explicitly deciding on this ratio would be to apply discounting, whereby project developers would receive a discounted amount of carbon credits, as was done, for example, by France (Shishlov et al. 2012).

In contrast to the project/programme level, upscaled Article 6 transactions by their nature will not be planned and executed by the private sector. Here, the host country government will need to provide incentives for the private sector to undertake mitigation actions, and in turn retain the ITMOs generated by the supported activities. If an incentivizing policy instrument exists, individual projects triggered by the policy should not receive ITMOs. Otherwise, the private sector would benefit twice – through the policy incentive and ITMO transfer revenue, which would lead to an inefficient outcome.

Policy instruments that can serve as incentives for private sector mitigation

Governments can use various policy instruments in order to incentivize private sector supply of ITMOs on a sectoral level. As discussed by Gupta et al. (2007), domestic level mitigation policies that can mobilize private sector mitigation leading to ITMOs under Art. 6 include (i) regulation, (ii) market mechanisms, (iv) subsidies and incentives, and Public-Private Partnerships. In the following, these are presented and discussed with respect to their ability to efficiently incentivize private sector mitigation.

Regulation and Standards

Regulation and standards (also referred to as command-and-control) include the setting of standards and limits, such as minimum efficiency levels for cars or buildings (performance standards) or the use of a specific abatement technology, e.g. a requirement for households to utilize Solar Water Heaters (technology standards). Such regulatory interventions are typically used in cases where the implementation of the mitigation option would be viable but other barriers, such as information asymmetries, prevent the scaled-up uptake of such a technology.

Market mechanisms

National policies that introduce market-based mechanisms based on carbon prices, such as carbon taxes or emission trading schemes, could enable the supply of Article 6.2 and 6.4 ITMOs. Key to the effectiveness of the carbon pricing schemes are the carbon price levels that result from a policy decision (carbon tax) or from the overall emission allocation levels in an emission trading scheme. Both have the effect that mitigation options with abatement cost lower than the set carbon price will be implemented in order to avoid tax payments or purchase of emission allowances.

Subsidies and incentives

Subsidies and incentives can support low-carbon investments or incentivize investments in early-stage technologies. The two main approaches to deliver this support are to either provide support on the revenue side of the project, or to reduce its cost of implementation. In the case of the former, governments may introduce feed-in-tariffs or standardized power purchase agreements (PPAs) for renewable energy projects or public-sector fees paid to infrastructure projects in the transport sector. In addition, the government can remove existing subsidies for carbon-intensive technologies in order to reduce their cost-advantage over low-carbon alternatives.

To reduce costs of mitigation activities, governments can also incentivize the private sector through granting tax exemptions or accelerating depreciation. Both lead to a lower tax burden of a private sector project or the respective investor and therefore result in improved financial viability/bankability. Furthermore, governments can provide support through targeted subsidies, or financing support – for example, certain low-carbon investments may have higher capital requirements and may therefore require dedicated provision of funds by public finance institutions, such as development banks. Such financial instruments can take various forms, such as provision of (re-payable) grants, concessional loans, or guarantees (Kempa and Moslener 2017), as well as equity investments from public sources.

Public-Private Partnerships

The implementation of mitigation technologies may also be enabled through Public-Private Partnerships (PPP). Such partnerships have long been seen as a promising instrument for leveraging capacities beyond state level in order to realize sustainable development globally (Pattberget al. 2012; Szulecki et al. 2012). One of the potential advantages of PPPs is that they pool resources, thus theoretically allowing each partner to play to its strengths (Pauw and Chan 2018). In the context of Article 6, a partnership with private-sector partners could help to bring in sector-specific expertise and efficient management associated with the private sector. At the same time, the government can take on a high level of risk, which would otherwise need to be shouldered by the private and may have prevented private sector engagement. However, other researchers have criticized PPPs for exploiting public sector entities (see Jensen and Dowlatabadi 2018)

Parameters affecting private sector supply of ITMOs

There are numerous factors affecting the incentives of private sector engagement in mitigation activities that may ultimately result in the supply of ITMOs. In general, private actors have an incentive to engage in mitigation activities if the expected returns from operationalizing the activity exceed associated development costs over the economic lifetime. Thus, in general, increasing carbon prices will strengthen the incentives for developing new mitigation projects. The impact carbon prices will have on the viability of scaled up mitigation actions, however, will depend on the importance of carbon revenues in an activity's overall revenue structure. The more important the potential carbon revenues from supplying carbon credits, the higher are the effects (Lütken and Michaelowa 2008).

Another parameter affecting private actors is the availability and attractiveness of mitigation options. Typically, the mitigation costs of existing technologies decrease of time. Technological progress results in reductions of technology-based abatement costs and thus positively affects the economic viability of these technologies.

Furthermore, the capability of the private sector to engage in mitigation activities is largely dependent on the availability of domestic capital (equity) (Lütken and Michaelowa 2008). Projects with the motivation and potential for ITMO supply are likely to be partially if not mainly developed and financed domestically. Thus, the potential of private sector ITMO supply largely depends on a host country's investment capacity. Eventually, the collective financing capacity in a host country runs out and any further investment will need to stem from foreign direct investment (FDI). Rising carbon prices, combined with policies incentivizing private sector demand discussed in the previous section, would attract investors outside the host country and thus enable the generation of higher volumes of ITMOs. A technological progress widens the spectrum of feasible mitigation technology choices and thus finally potential ITMO supply. This aspect is particularly important in developing countries, which are typically characterized by lower capital endowments compared to industrialized countries. Therefore, it is more likely developing countries lack enough capital to support all mitigation projects that are otherwise viable investment opportunities.

The valuation and application of discount rates applied by the private sector are another relevant issue (Lütken and Michaelowa 2008). These are relevant as carbon revenues typically materialize in the future, i.e. substantially after the investment decision, and thus need to be discounted in order to determine the net present value, which is the basis of an investment decision. In the case of a rational firm, the discount rate would be equal to the lending rate. In case of risk-aversion, however, the individual investors' discount rates exceed lending rates. The same project could therefore have different internal rates of return (IRR) across investors, who differ in their access to attractive funding, to suppliers of technology, or particularly attractive power purchasing agreements (Lütken and Michaelowa 2008, p. 137). The higher the risk-aversion and the discount rates, the more projects are not implemented.

An additional parameter reducing the attractiveness of mitigation activities are potential knowledge or learning spillovers. A firm's investment into a new mitigation technology typically creates benefits for others, who might learn from observation. The investment costs, however, are covered only by the investing firm. Thus, firms using new technologies cannot entirely internalize the benefits of their investment, which might lead to underinvestment in new (mitigation) technologies (Popp, Jaffe, and Newell, 2010). This market barrier is likely higher in countries with relatively low previous mitigation investments resulting in a relatively low knowledge stock concerning the respective mitigation technologies.

Finally, imperfections in financial markets might also deter private sector mitigation action. The access to, in particular, long-tenor debt financing and the overall efficiency of the functioning of the finance sector are core drivers of investments in mitigation projects (e.g. renewable energy and energy efficiency) (Haas and Kempa 2019). In contrast to the issue of discount rates mentioned above, this investment barrier is driven by the lenders (banks), which, due to limited knowledge or experience, are not capable to (fully) assess the risk of mitigation activities and thus provide financing and unattractively high costs, if at all. All these imperfections on financial markets are likely to be more predominant in developing economies, where the financial sector is typical less developed, which might further deter access to finance.

On the choice of national policy instruments to effectively and efficiently incentivize private sector supply

As mentioned above, Article 6 activities on the project or programme level offer the possibility for the private sector to generate revenues through international transfer of ITMOs and thus directly provide incentives for ITMO supply. In the case of national policies accounted as Article 6 activities, the possibility to generate revenues through international transfer of ITMOs accrues to the host government. But government will only be able to receive ITMOs if there are incentives for the private sector to mitigate. The main principle here is that the carbon revenues from the international transfer of ITMOs can be used by the host government to incentivize the private sector to mitigate (e.g. through subsidies and / or (partially) compensate the private sector for the costs incurred through a regulation or carbon pricing policy. The national host government can use any of the policy instruments listed above to incentivize Article 6 credit supply. The choice of national policy instrument depends on the parameters affecting private sector supply of ITMOs, which differ across countries, sectors, and mitigation technologies.

The national government could incentivize ITMO supply by using market based instruments, e.g. an ETS. Consider a host country with an existing national ETS. In order to encourage private sector ITMO supply through emission reductions, the national government can reduce the cap under the ETS in order to generate (additional) emission reductions compared to the old emission cap. For the mitigation due to the difference between the old and new cap, the national government can sell ITMOs and generate revenues. These revenues could then be transferred to firms in the ETS in order to reimburse them for (part of) their abatement costs that are due to the tighter cap. Alternatively, also standards could be used to incentivize the supply of carbon credits. The national government could, e.g., introduce a policy requiring a certain performance standard in order to reduce emissions in a certain sector; firms subject to the standards could receive ITMO sales revenues from the government.

Another possibility to strengthen private sector supply might be pre-financing of Article 6.2/6.4 emission reduction units by the national government. The CDM experience has shown that using expected future revenues from carbon credits is likely not to be accepted by commercial financiers. This barrier could be alleviated if expected future carbon revenues of a private sector mitigation activity could be allocated to a dedicated financing mechanism that (co-)funds up-front project development costs.

A national climate fund could thus offer subsidized financing, grants, or loan guarantees based on the discounted value of future carbon revenues (for a more detailed discussion of possible pre-financing instruments for carbon credits see Ci-Dev (2016)). The choice of the financial instrument depends on the mitigation technology's novelty and cost structure. In the case of early-stage, high-risk mitigation technologies, grants could be applied. As these employ the lowest risk for the private sector recipient, grants are capable to encourage follow-up investment in early-stage mitigation technologies or first of its kind applications of mitigation technologies. Other instruments, such as concessional loans or guarantees, in turn should target the scaling of mature technologies, in particular their deployment. In order to avoid crowding out commercial sources of finance, over time preference should lean towards the application of loans and guarantees to support mitigation action.

PPPs can also be an effective mechanism to incentivize private sector mitigation action. Such PPPs can take many different forms. For instance, in the mini-grid space, there are cases where government agencies share ownership with private sector investors in order to reduce private-sector investment risks. Another country-specific example is the state-owned Geothermal Development Company (GDC) in Kenya that offers to undertake the drilling of geothermal wells – a project phase with very high capital investment requirements from which private investors typically shy away – while subsequently selling the steam to the private sector investor that owns the power plant. Thus, PPPs might be an effective tool for enabling private sector supply of Article 6 units, in particular in the case of rather risky mitigation actions.

In general, it is essential to consider that investment barriers change over time for specific mitigation technologies. Typically, there is a reduction of barriers over time that results in decreasing overall costs of mitigation technologies, e.g. due to learning effects and technology improvements or increasing experience with a technology of financiers and private sector actors. This might result in a situation where a certain technology does only need reduced or no government support to be considered attractive by the private sector. At the same time, new and typically (at least initially) costly technologies become available. This stresses the importance for a continuous updating of baseline setting and the concept of how additionality is determined and adjusted over time. In order to avoid inefficient spending of public funds, government support should move away from technologies that have obtained a cost advantage over time and prioritize giving support to new, more high-risk mitigation technologies.

While this section focuses on upscaled Art. 6 transactions that need government incentives to encourage private sector participation it should be mentioned for completeness that it is likely that project/programme based intervention will also benefit from national and international policy developments. Even in the presence of the carbon price signal, certain mitigation technologies might not have a cost advantage. In these cases, additional government interventions might be required to encourage project development in particular mitigation sectors. In particular, on the international level, blending market-based Article 6 mechanisms with climate finance could be a suitable approach to tackle challenges like these. The issue of blending climate finance with carbon revenues is revisited in further detail in chapter 6.

5.3. Transversal considerations

What relevance has the provision of services related to carbon market activities in relation to the actual mitigation activities themselves?

Experience from existing carbon markets show that if prices for credits and traded volumes are sufficiently high, carbon markets will automatically generate private sector engagement in provision of services related to the market created by Article 6, as described in section 0 above. Additionally, given the diversity of the types of private sector actors involved in carbon market activities, these actors will seek different kinds of opportunities in participation in the new market mechanisms.

For consultants, carbon markets have been providing business opportunities for advisory services relating to identification of promising mitigation opportunities, technology choice, methodology development, project design and documentation (Subbaro 2011), which will also be the case for ITMOs under Article 6. The existing cap-and-trade as well as baseline-and-credit schemes have led to traditional quality assurance and certification providers as well as newcomers to offer services validation and verifications of offset projects as well as verification of GHG emission reports for installations in cap-and-trade schemes. Under the CDM for example, such service providers are accredited as Designated Operational Entities (DOE). DOEs validate the project documentation and verify the project implementation prior to credit issuance. However, incentive problems have arisen as they are being hired by the project developers themselves. In reaction, the CDM Executive Board (CDM EB) tightened control over DOEs, which significantly increased the time needed for registration and issuance (Michaelowa and Buen 2012).

In the CDM, commercial banks were often involved in financing project development costs, occasionally using future carbon revenues as a source of collateral. They also set up carbon funds to generate low-risk portfolios for buyers of carbon credits.

In all large CDM host countries such as Brazil, China and India, a wealth of consultancies emerged that provided specialized expertise linked to carbon asset development, in particular in the renewable energy and energy-efficiency sector. Local companies discovered CERs as an export commodity and developed a unilateral model of engagement with the CDM, where they developed CDM projects themselves to market CERs (Lütken and Michaelowa 2008).

Having a vibrant sector of CDM consultancies benefitted Brazil to take the early lead in CDM project development. The same happened in China and India, where consultancies surveyed the country for CDM potential, mainly in heavy industries but also beyond, applying a business model where they would develop all CDM documentation at a zero financial fee, retaining only a share of the CERs. In this manner, the Indian branch of the consultancy Ernst & Young developed hundreds of CDM project documents almost in an assembly-line fashion (Michaelowa and Buen 2012).

Some consultancies engaged in methodology development to implement bold business ideas. So did for instance the UK company INEOS Fluor that submitted a baseline methodology on the thermal destruction of HFC-23. As the accompanying document estimated huge annual emission reductions feasible from one plant, international donor organizations and consultants swarmed to identify similar projects. A “boom and bust” cycle characterized many new project types under the CDM, with new methodologies unleashing wave of imitations before being choked off by increasingly stringent regulations from the CDM EB as it learned more about the drawbacks of the project types in question (Michaelowa and Buen 2012).

If the demand and pricing outlook for Article 6 units grows positive, companies and industry associations are likely to seek new business opportunities in project identification, development and marketing as they had done under the Kyoto Protocol. The financing of new projects will provide an opportunity for financial institutions seeking to support climate-friendly investments, as well as for institutional investors diversifying their portfolio and looking for socially responsible investments. Finally, brokers and traders will also join the space, providing liquidity to the market and supporting price discovery through brokerage and trading services.

6. Combining Art. 6 with public climate finance

Key messages:

- Results-based climate finance can lead to demand for ITMOs that are subsequently cancelled.
- Blending of ITMO revenues with public climate finance is important to mobilize higher-cost private sector mitigation. However, in order to prevent double claiming, ITMOs should be issued for the share of the total financing of the activity provided by the ITMO sales revenue

This section analyzes the relation of Article 6 activities and revenues with other streams of climate finance, in particular bilateral and multilateral mitigation finance. First, the role of results-based climate finance as a non-compliance source for ITMO demand will be discussed. Second, we will analyze blending of Article 6 revenues with other streams of climate finance.

6.1. Results-based climate finance as demand source for Article 6 units

Based on the experience with market mechanism under the KP, multilateral financial institutions (MFIs) could become important actors with respect to generating demand for Article 6 units. One avenue through which this could be achieved is through results-based climate finance (RBCF). Results-based financing emerged in debates revolving around development co-operation and aid effectiveness in the context of increasing pressure on donors to be accountable, both towards recipient countries and their own citizens (Klingebiel et al. 2019).

Results-based financing also received traction in the field of climate change, in particular on REDD+. For example, Norway has established result-based partnerships with seven countries and by 2016 claims to have already contributed to 20 million tons of emission reduction abroad, and Brazil states in its NDC that the implementation of REDD+ activities requires the provision of adequate and predictable results-based payments (Hein et al. 2018). In 2019, the Green Climate Fund indeed decided on providing results-based payments worth US\$ 96,5 million for REDD+ achievements in Brazil's Amazon biome in 2014 and 2015 (GCF 2019).

In contrast to upfront financing, RBCF is a financing modality or approach where a financier disburses funds to a recipient upon the achievement of a pre-agreed climate mitigation outcome. According to Benitez et al. (2017) the following four criteria must be met for financing to qualify as RBCF:

- i. Payments are made for climate mitigation or adaptation results
- ii. Payments are made ex post
- iii. Payments are made once predefined results have been achieved; and
- iv. Reported results have been independently verified.

In the context of Article 6, MFIs could use mitigation outcomes as the triggers for payments.

While RBCF can be a powerful approach to support operational expenses once projects or programmes are up and running, it does not enable project developers to close financing gaps associated with upfront capital expenditures (CAPEX). For example, renewable energy projects require capital intensive upfront investments in infrastructure and equipment. MFIs and donors should be cognizant of the limitations of RBCF, and should structure their engagement in ways that enable project developers to also access financial resources upfront. As under the CDM, future revenues from RBCF alone will unlikely to be sufficient to instigate commercial banks to provide financing to cover the CAPEX. This is a risk, as it may lead to a bias of the types of activities that are viable under pure RBCF approaches, i.e. projects where the contributions of carbon revenues are not critical for the investment to go ahead (Ci-Dev 2016).

MFIs could also provide price stability mechanisms for the price of carbon on a larger scale by facilitating or funding a mechanism similar to the World Bank's Pilot Auction Facility for Methane and Climate Change Mitigation (PAF) within the CDM. The PAF provides a results-based payment mechanism that applies a price floor for future carbon credits in the form of a tradeable put option⁶. The creation of such a mechanism was motivated by the 2011 collapse of market prices for CDM credits, when mitigation options with relatively high operating costs like methane abatement activities were not incentivized to function anymore (Sylvester 2014, Bodnar et al. 2018).

⁶ Such an options provides owners of credits the right, but not the obligation, to sell the emission reductions achieved through PAF projects at a pre-agreed price.

The objective of the PAF mechanism is to revive stranded assets by allowing those projects to participate in auctions and bid for CDM credit price guarantees. The most cost-efficient project developers received a claim on the guarantees, which gave them the right, but not the obligation, to sell emission reductions to the PAF at a pre-agreed price. If the market price rises above the price floor, this optionality allows selling the emission reductions at this higher market price. Within the market-based mechanisms of Article 6, MFIs could set up similar approaches in order to create a demand for ITMOs and thereby provide price stability, which, in turn, provides incentives for the private sector supply of Article 6 units due to reduced carbon price risks. ITMOs acquired through the use of public climate finance would have to be cancelled (see discussion in section 3).

6.2. Blending of Article 6 revenues with climate finance

An import issue – in particular from the perspective of policy considerations in this regard – is the link between market-based activities under Articles 6.2/6.4 and other streams of multi- or bilateral climate finance. Where such ‘blending’ of resources exists, it will be important to specify the conditions under which financial support to mitigation activities can actually be counted as climate finance in the context of Article 9 of the Paris Agreement. With respect to this question, the Katowice texts state in the Annex on Article 6.8 under II.f that an NMA is “[...] recognized for the finance, technology transfer and/or capacity-building support it contributes in the course of the cooperative approach or Article 6, paragraph 4, activity, if the mitigation outcomes are not transferred and used only by the host [developing country] Party of the cooperative approach or Article 6, paragraph 4, activity towards its NDC.” This formulation indicates that a developed country’s financial contribution does not count as climate finance if the mitigation outcomes are transferred towards the country that provides support. The Katowice texts further say that “The recognition of the support provided by the [developed country] Party is proportional to the mitigation outcomes retained by the host Party in its engagement in the cooperative approach or Article 6, paragraph 4, activity.” This would mean that if, e.g., 50% of the mitigation of the Article 6.2/6.4 activity is transferred in form of ITMOs, only 50% of the accompanying non-market approach under Art. 6.8 (e.g. a concessional loan) can be accounted for as climate finance. This guidance avoids double counting if market based mechanisms and non-market approaches are jointly used in order to achieve a certain mitigation outcome in the host country. All these texts, however, are still contested (bracketed) and thus are still likely to change.

In the early era of the CDM, there was a so-called “iron curtain” between the CDM (market mechanism) and the Global Environmental Facility (climate finance) (Ci-Dev, 2016b). The main rationale was to avoid double counting of climate finance (Mikolajczyk et al. 2016). A similar approach seems to be applied for CDM projects being awarded GCF funding: One specific case is a PV project in Chile, which was approved under the condition that it would not seek to issue and sell CDM credits, i.e. it was asked to cancel these credits (Climate Focus, Perspectives and Aera Group 2017).

Such strict separation between climate finance and market mechanism is certainly not warranted. As long as the activity requires both public climate finance and revenues from ITMO sales to become viable, it should be able to receive ITMOs as well as being counted towards climate finance. This should be subject to the condition that the mitigation is allocated pro rata to the financing sources. For example, if the overall financing consists of 30% ITMO revenues and 70% public climate finance measured in grant equivalent, not more of 30% of the mitigation should be transferable in form of ITMOs. Given that public climate finance providers have an interest not to overfund activities, one would hope that one would not see many cases where mitigation activities receive “overfunding”.

Blending of market mechanisms and climate finance is useful in particular to mobilize higher cost measures and overcoming investment barriers that remain even in the presence of a carbon price signal, e.g. limited access to finance. Additional support through (upfront) climate finance can be critical to get activities off the ground. Thus, climate finance is important to flank market mechanisms until investment barriers disappear. Furthermore, blending of climate finance and carbon revenues could potentially also result in increased NDC ambitions, as higher demand for mitigation outcomes could trigger higher carbon prices and thereby allow countries to realize investment higher up on the abatement cost curve. This, in turn, would trigger scaled-up engagement of the private sector in Article 6.

7. Mapping research and knowledge gaps

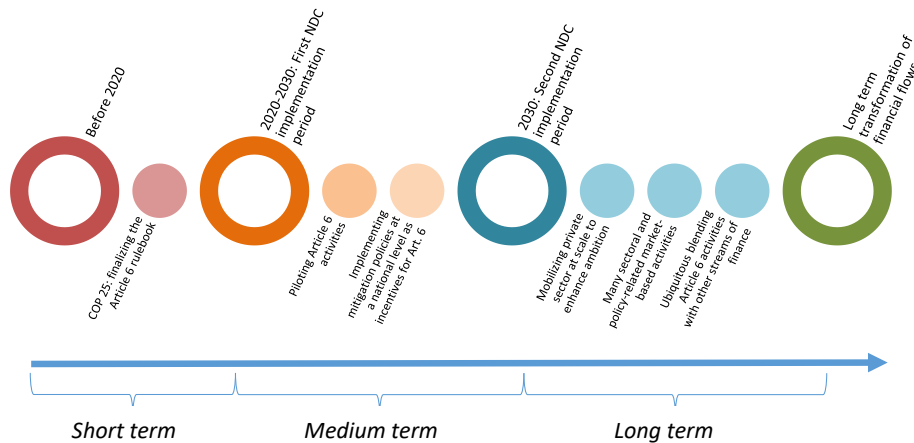
How can Article 6 market mechanisms be designed to incentivize mobilization of private financing and contribute to support Article 2.1c of the PA? This question cannot be exhaustively answered in the context of this study. But a substantive body of research exists on the lessons to be learned from the Kyoto mechanisms, the blending of finance and the architecture of international market mechanisms allows us to make critical suggestions and identify further research questions. We differentiate between the three levels of aggregation: international, national and private sector level. The scoping builds upon the knowledge gaps identified in this report as well as other existing studies on related topics.

The research questions were identified through the consideration of the following criteria:

- There is an identified research gap/ existing research is to be re-evaluated in the context of the Paris Agreement
- Research on the policy option is important to enhance effectiveness of the mechanisms, meaning, private finance can be mobilized to:
 - o Enhance ambition of action
 - o Promote environmental/sustainable development co-benefits
 - o Spur innovation
- Research on the policy option is important to enhance efficiency of the mechanisms, meaning private finance can be mobilized to:
 - o Identify cost-effective mitigation potential
 - o Attract finance for long-term efficiency (achieve transformational impacts)

Furthermore, research questions must be relevant for the short, medium and long term mobilization of the private sector. Figure 3 details the ideal development of Article 6 based mobilization of the private sector in order to achieve the long-term goals of the Paris Agreement.

Figure 3: Private sector mobilization through Article 6 of the PA over time⁷



Source: authors

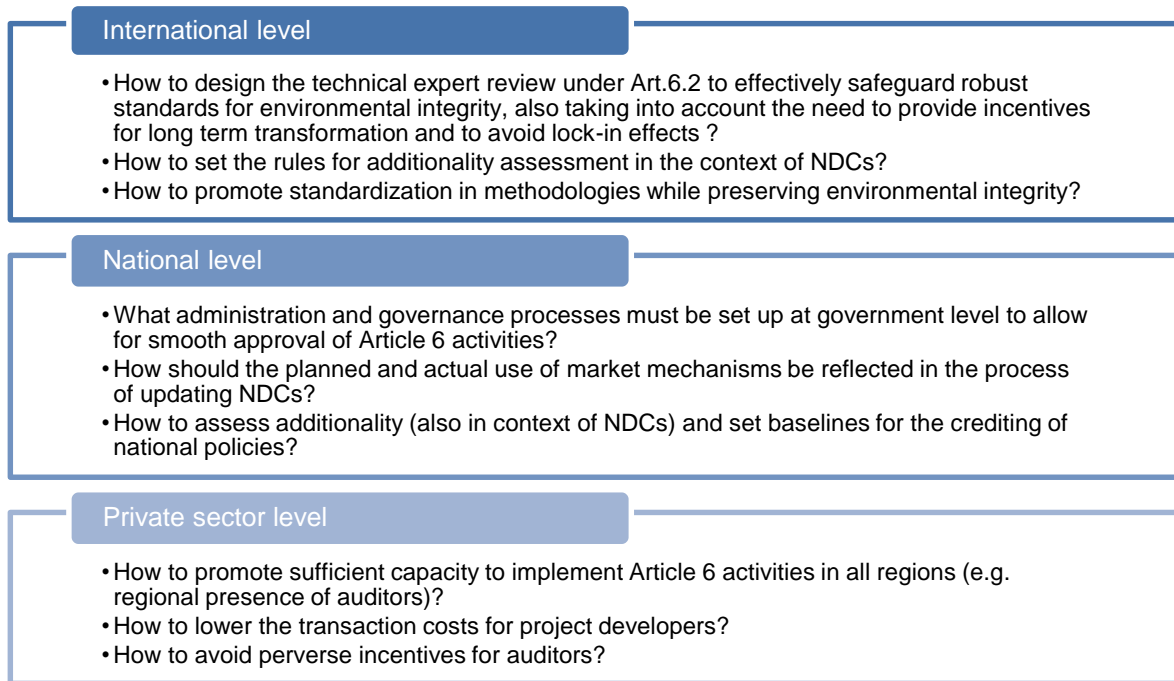
Questions relevant in the short term are therefore:

- Contentious and/or complex issues in the negotiations (e.g. accounting for different NDCs, define a robust activity design with regard to baseline setting and additionality)
- Issues that need to be considered in the first update of NDCs by 2020 (e.g. on the compatibility of NDCs and Article 6)
- Issues needed to organize the transition of Kyoto and voluntary markets into the new system
- Issues that should be tested in the context of piloting of Article 6

⁷ Note that this is indicative. Some countries' first NDCs have an implementation period until 2025 only.

The following priority research questions have been identified in the short term:

Figure 4: Priority research questions on the mobilization of the private sector through Article 6 in the short term



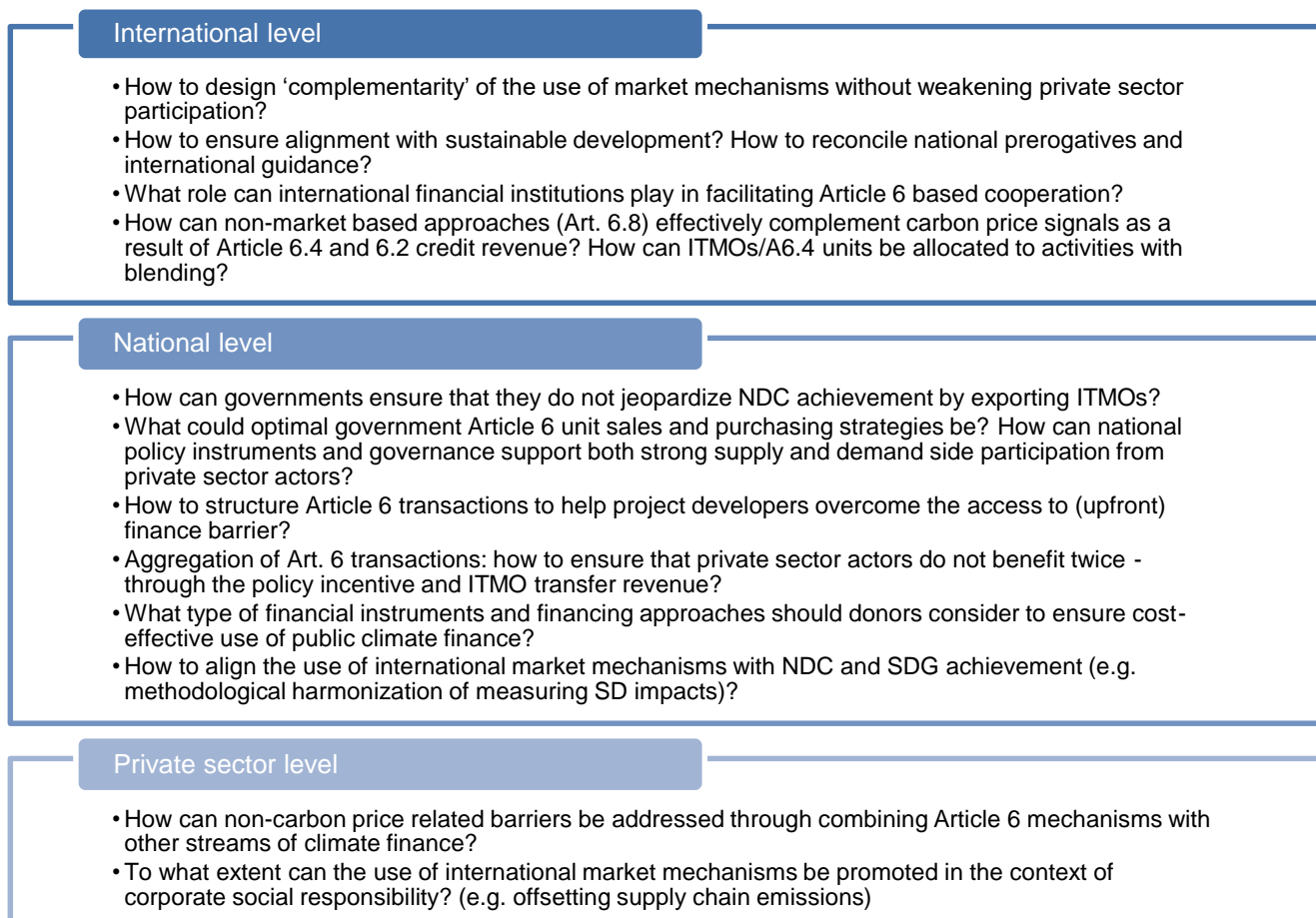
Source: authors

In the medium term, those policy options are relevant that will define how international market mechanisms are used to implement NDCs as well as to mobilize action to enhance ambition. The time horizon is therefore the first NDC implementation period, i.e. 2020 to 2030. Questions relevant in the medium term are therefore:

- Questions related to accounting for Article 6 activities and the blending of finance in the context of NDCs
- Design of policy instruments generating supply or demand
- Policies and procedures to safeguard and promote NDC achievement through use of international market mechanisms
- Policies and guidelines to align the use of international market mechanisms with sustainable development

The following priority research questions have been identified in the medium term:

Figure 5: Priority research questions on the mobilization of the private sector through Article 6 in the medium term



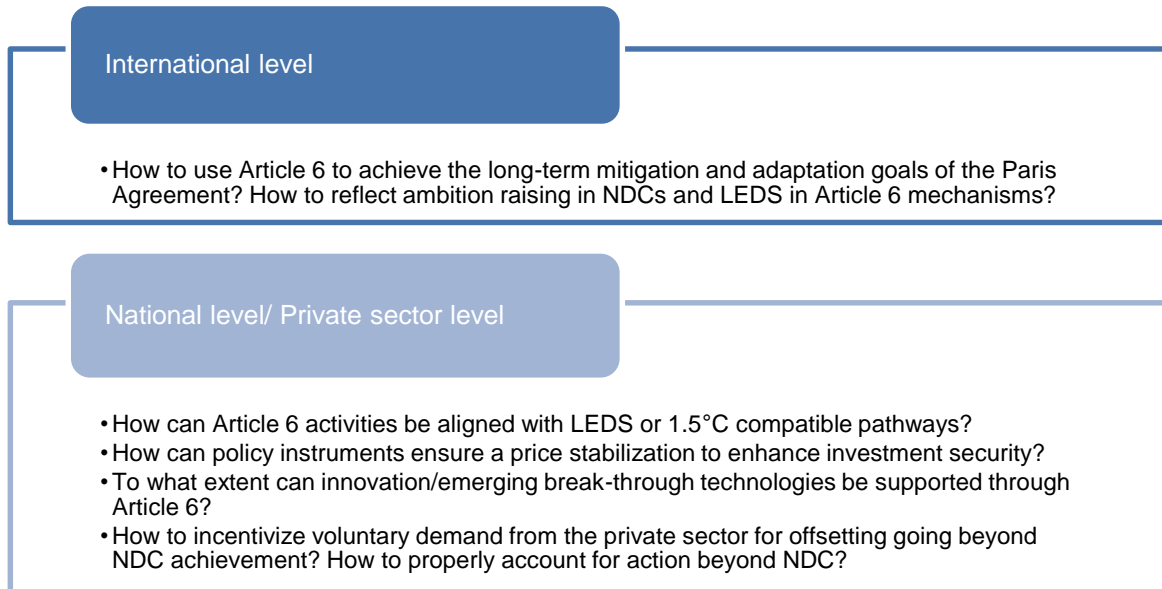
Source: authors

In the longer term, cooperation under Article 6 should focus on ambition raising and its compatibility with the long-term goals of the Paris Agreement with the time horizon for 2050. Questions relevant in the long term are therefore:

- Rules, guidelines and instruments to align Article 6 activities with 1.5°C compatible pathways and LEDs
- Instruments to incentivize voluntary demand beyond NDCs to accelerate transformation
- Policy options to de-risk and promote transformational investments

The following priority research questions have been identified in the long term:

Figure 6: Priority research questions on the mobilization of the private sector through Article 6 in the long term



8. Conclusions and outlook

Ensuring that international market mechanisms for climate change mitigation mobilize private sector finance requires careful design of the underlying rules and incentive structures. Insufficient consideration of the needs of the private sector in the future mechanisms under Art. 6 of the PA could constrain their contribution to increasing global mitigation ambition.

The experiences with the Kyoto Protocol and its three international market mechanisms (CDM, JI and international emissions trading) provide many important lessons that should guide rule-setting for the Article 6 mechanisms. The CDM shows that a mechanism that has limited government interference, and that is driven by stable and long-term credit demand can generate thousands of mitigation activities of widely varying scale and type within a short period, even in environments that are difficult for business operations. While regulators were initially overwhelmed by the success of the CDM, a regulatory framework willing to learn was key to a maturing of the mechanism which managed to mobilize hundreds of billions USD in less than a decade (see UNEP DTU 2019). One key to the success of the CDM was that private sector entities were enabled to produce mitigation credits as an export commodity, thus overcoming the reluctance of industrialized country-based companies to directly invest in developing countries in fields not linked to their core business (see Lütken and Michaelowa 2008). Unfortunately, trust of public actors in the mechanism and therefore demand for its credits diminished and did not pick up again, even after extensive reform processes. As a consequence, trust of private sector players in the long-term future of the CDM eroded due to the low prices for CDM credits after 2011, but many project developers and consultants hoped for a revival subsequent to the entry into force of the Paris Agreement.

JI shows the challenges that a market mechanism faces which relies strongly on government action. Many JI host countries were unclear regarding the process to allocate emission reduction units to JI activities, leading to a lack of trust of private sector players and a loss of several years.

So far, there is no experience with crediting of mitigation policy instruments or sector-wide activities. While various countries have shown their ability to introduce such instruments, it remains open whether private sector players will mitigate more if they receive a “rebate” on costs caused by carbon pricing instruments through government redistribution of revenues from ITMO sales. Will companies take the prospect of such “ITMO dividends” seriously? Will they trust that government will not siphon off such revenues into the general budget?

A lot of tension between regulators and private sector players developed regarding the issues of additionality testing and baseline setting over the years. Private sector entities would have preferred a complete absence of additionality testing in order to get an “icing on the cake” for already profitable investments. Likewise, they wanted to maximize credit generation through lenient baselines.

Much work remains to be done to convince public climate finance providers that there is a case for blending public climate finance with revenues from ITMO generation. The prevailing “iron curtains” between these two financing forms needs to be torn down. Only this will allow to mobilize private activities in areas with high mitigation costs, which will be required to achieve the ambitious long-term target of the PA. A clear approach to the allocation of mitigation results to the two strands of financing, and the volume of ITMOs issued should be enshrined in the Article 6 rulebook.

Private finance is a very shy animal. It runs away at the first sign of risk, especially policy related. We hope that negotiators understand that private sector investment in mitigation and especially market mechanisms cannot just be “switched on” at will, but requires a robust regulatory foundation and political willingness to act. In this context, further research and thinking is needed to develop this robust framework that interlinks the international, national and private sector level and that can guide political decisions on market-based cooperation promoting the achievement of the long-term goals of Article 6 of the Paris Agreement. Key issues to be addressed in the short term include development of additionality tests that are credible but that do not entail high transaction costs, combined with credible and effective audit procedures, as well as diffusion of domestic policy instruments that accept ITMOs/A6.4ERs as offsets. In the medium term, blending of public climate finance with private Article 6 activities needs to be tested, and agreement on attribution of mitigation found. For the long term, ways to align Article 6 with 1.5°C compatible emissions pathways and rising ITMO/A6.4ER price paths need to be explored.

References

Australian Government, Department of the Environment and Energy (2019): About the Climate Solutions Fund – Emissions Reduction Fund. <https://www.environment.gov.au/climate-change/government/emissions-reduction-fund/about> (accessed April 4, 2019)

Australian Government, Department of the Environment and Energy (2016): The safeguard mechanism – overview, <http://www.environment.gov.au/climate-change/government/emissions-reduction-fund/publications/factsheet-erf-safeguard-mechanism> (accessed April 9, 2019)

Benessaiah, Karina (2012): Carbon and livelihoods in Post-Kyoto: Assessing voluntary carbon markets, in: Ecological Economics, 77, p. 1-6

Benitez, Pable, Gruening, Christine, Kreibiehl, Silvie, Lypiridis, Charis, Moslener, Ulf, Oppermann, Klaus, Ott, Caroline, Spors, Felicity, Zhuang, Menglu (2017): Results-Based Climate Finance in Practice: Delivering Climate Finance for low-carbon Development, World Bank, Washington. <https://openknowledge.worldbank.org/handle/10986/26644> (last accessed April 16, 2019)

Bolden, Ralph; Noens, Vicky (2018): Climate finance: too much on detail, too little on the big picture?, in: Climate & Carbon Law Review 2, p. 248-257

Bodnar, Paul; Ott, Caroline; Edwards, Rupert; Hoch, Stephan; McGlynn, Emily; Wagner, Gernot (2018): Underwriting 1.5°C: competitive approaches to financing accelerated climate change mitigation, in: Climate Policy, 18, p. 368-382

Carbon Market Watch (2014): The role of international offsets in the fuel quality directive, Policy Briefing, Brussels

Carbon Market Watch (2019): First class or economy? An Assessment of credit providers for the aviation offsetting scheme, Carbon Market Watch Policy Brief, Brussels

Carbon Trust, EDF, IETA (2018): Colombia. An emissions trading case study, https://www.ieta.org/resources/Resources/Case_Studies_Worlds_Carbon_Markets/2018/Colombia-Case-Study-2018.pdf (accessed April 04, 2019)

CE Delft (2016): A comparison between CORSIA and the EU ETS for aviation, https://www.cedelft.eu/publicatie/a_comparison_between_corsia_and_the_eu_ets_for_aviation/1924 (accessed April 4, 2019)

Ci-Dev (2016a)^o: A New Approach for Pre-Financing Emission Reduction Purchase Agreements for Household Energy Access Programs, Report prepared by Frankfurt School FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance under the guidance of a World Bank Ci-Dev team, <https://www.ci-dev.org/sites/cidev/files/documents/Prefinance.pdf> (last accessed April 12, 2019)

Ci-Dev (2016b)^o: The impact of INDCs, NAMAs and LEDS on Ci-Dev operations and programs, Report prepared by Axel Michaelowa, Valentin Friedmann, Stephan Hoch, Matthias Honegger and Frederic Hans (Perspectives Climate Research) under the guidance of a World Bank Ci-Dev team led by Leon Biaou and including Felicity Spors, Harikumar Gadde, Claudia Barrera and Klaus Oppermann, <https://www.ci-dev.org/sites/cidev/files/documents/INDCs.pdf> (last accessed April 28, 2019)

Climate Focus, Perspectives and Aera Group (2017) Linking the Clean Development Mechanism with the Green Climate Fund: Insights from Practitioners and Decision Makers in Africa, https://www.perspectives.cc/fileadmin/Publications/Linking_the_clean_development_mechanism_with_the_GCF_Brescia_Dario_Galt_Hilda_Mayr_Sebastian_2017.pdf (last accessed April 25, 2019)

Climate Policy Initiative (2018): Global Climate Finance: An Updated View 2018, Venice

Davies, Emily (2018): Recommendations for an international carbon currency market under Article 6 of the Paris Agreement, in: Carbon & Climate Law Review 2, p. 132-139

EBRD (2017): Operationalising Article 6 of the Paris Agreement: perspectives of developers and investors on scaling-up private sector investment, London

European Commission (2015): Guidance note on approaches to quantify, verify, validate, monitor and report upstream emission reductions, https://ec.europa.eu/clima/sites/clima/files/guidance_note_on_uer_en.pdf (accessed April 9th, 2019)

Fearnehough, Harry; Day, Thomas; Warnecke, Carsten; Schneider, Lambert (2018): Marginal costs of CER supply and implication for demand sources, Discussion Paper, German Emissions Trading Authority (DEHSt), Berlin

GCF (2019): Project FP100: REDD+ results-based payments for results achieved by Brazil in the Amazon biome in 2014 and 2015, <https://www.greenclimate.fund/projects/fp100> (accessed June 4, 2019)

Government of India (2015) : Climate Change Finance, analysis of a recent OECD report: some credible facts needed, Discussion paper, <http://pibphoto.nic.in/documents/rlink/2015/nov/p2015112901.pdf> (last accessed April 4, 2019)

Green, Jessica (2007): Delegation to private actors. A case study of the Clean Development Mechanism, IILJ Emerging Scholars Papers, New York

Gupta, Sujata; Tirpak, Dennis; Burger, Nicholas; Gupta, Joyeeta; Höhne, Niklas; Boncheva, Antonina; Kanoan, Gorashi; Kolstad, Charles; Kruger, Joseph; Michaelowa, Axel; Murase, Shinya; Pershing, Jonathan; Saijo, Tatsuyoshi; Sari, Agus (2007): Policies, Instruments and Co-operative Arrangements, in: Metz, Bert; Davidson, Ogunlade; Bosch, Peter; Dave, Rutu; Meyer, Leo (eds): Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, p. 746-807

Haas, Christian, Kempa, Karol (2019): Clean Energy Investment and Credit Rationing, https://www.researchgate.net/publication/330245294_Clean_Energy_Investment_and_Credit_Rationing (last accessed April 27th, 2019)

Hamrick, Kelley; Gallant, Melissa (2017): Unlocking potential. State of the voluntary carbon markets 2017. Ecosystem Marketplace, Washington.

Hamrick, Kelley; Gallant, Melissa (2018): Voluntary Carbon Markets. Outlooks and trends January to March 2018; Ecosystem Marketplace, Washington.

Healy, Sean (2017): CORSIA: Quantification of the Offset Demand, Öko-Institut, Berlin, https://www.carbon-mechanisms.de/fileadmin/media/dokumente/sonstige_downloads/CTI_Workshop_2017/5_Healy_170623_CORSIA_CTI_Presentation.pdf (accessed April 9th, 2019)

Hein, Jonas, Guarin, Alejandro, Frommé, Ezra, & Pauw, Pieter (2018): Deforestation and the Paris climate agreement: an assessment of REDD+ in the national climate action plans, in: Forest Policy and Economics 90, p. 7-11.

Hermwille, Lukas; Kreibich, Nicolas (2016): Identity Crisis? Voluntary Carbon Crediting and the Paris Agreement, Jiko Policy Brief, Wuppertal, https://epub.wupperinst.org/frontdoor/deliver/index/docId/6607/file/6607_Identity_Crisis.pdf (accessed April, 9th 2019)

Hoch, Stephan ; Friedmann, Valentin ; Michaelowa, Axel (2018): Mobilising private-sector investment to mitigate climate change in Africa, Stockholm Environment Institute, <https://www.sei.org/wp-content/uploads/2018/05/private-finance-for-sub-saharan-africa-1.pdf> (last accessed April 3, 2019)

ICAO (2019): CORSIA Emissions Unit Eligibility Criteria, <https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Emissions-Units.aspx> (accessed April 9th, 2019)

ICAP (2019a): Mexico, ETS detailed information March 2019, Berlin, [https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems\[\]=59](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems[]=59) (accessed April 9th, 2019)

ICAP (2019b): Mexico releases draft regulations for pilot ETS system, <https://icapcarbonaction.com/en/news-archive/586-mexico-releases-pilot-ets-regulations-for-system-starting-in-2019> (accessed: April 9th, 2019)

IEA; IRENA (2017): Perspectives for the energy transition: investment needs for a low-carbon energy system, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Mar/Perspectives_for_the_Energy_Transition_2017.pdf?la=en&hash=56436956B74DBD22A9C6309ED76E3924A879D0C7 (accessed May 28, 2019)

IETA (2018): Piecing together the future of carbon markets, IETA Insights Quaterly Report N°4, https://www.ieta.org/resources/Resources/GHG_Report/2018/IETA%20Insights%20Q4_2018.pdf (last accessed June 7, 2019)

IPCC (2018): Global Warming of 1.5°C: summary for policymakers, https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf (last accessed April 3, 2019)

ICROA, IETA (2018): 4th ICROA workshop on increased voluntary action under the Paris Agreement, presentation held at COP24 on December 7, 2018, in Katowice, https://www.icroa.org/resources/Documents/ICROA_COP24_Workshop.pdf (last accessed April 18, 2019)

Jensen, Thor; Dowlatabadi, Hadi (2018): Challenges in financing public sector low-carbon initiatives: lessons from private finance for a school district in British Columbia, Canada, in: Climate Policy, 18, p. 878-888

Karp, Paul (2019): Budget 2019: Coalition cuts climate solutions fund by \$70million a year. The Guardian <https://www.theguardian.com/environment/2019/apr/02/coalition-climate-solutions-fund-must-last-further-five-years>

Kempa, Karol ; Moslener, Ulf (2017): Climate Policy with the Chequebook: an Economic Analysis of Climate Investment Support, in: Economics of Energy & Environmental Policy 6, p. 111-129

Klingebiel, Stephan, Gonsior, Victoria, Jakobs, Franziska, & Nikitka, Miriam (2019): Where tradition meets public sector innovation: a Rwandan case study for results-based approaches, in: Third World Quarterly, p. 1-19.

La Hoz Theuer, Stephanie; Schneider, Lambert; Broekhoff, Derik (2019): When less is more: limits to international transfers under Article 6 of the Paris Agreement, in: Climate Policy 19, p. 401-413

Lang, Sebastian; Blum, Mareike; Leipold, Sina (2019): What future for the voluntary carbon offset market after Paris? An explorative study based on the discursive agency approach, in: Climate Policy, 19, p. 414-426

Lütken, Søren, Michaelowa, Axel (2008): Corporate strategies and the Clean Development Mechanism, Edward Elgar, Cheltenham

McKenzie, Ian (2018): Australia's Emission Reduction Fund is almost empty: it shouldn't be refilled, in: The Conversation February 25, 2018, <http://theconversation.com/australias-emissions-reduction-fund-is-almost-empty-it-shouldnt-be-refilled-92283> (accessed April 4th, 2019).

McNicoll, Lauren, Jachnik, Raphael, Montmasson-Clair, Gaylor, Mudombi, Shakespear (2017): Estimating publicly-mobilised private finance for climate action: A South African case study, OECD Environment Working Papers, No. 125, Paris

MDBs [A group of Multilateral Development Banks] (2018): 2017 Joint report on multilateral development banks' climate finance, <http://dx.doi.org/10.18235/0001336>

MDBs and DFIs [A group of Multilateral Development Banks and Development Financial Institutions] (2018): Mobilization of private finance by multilateral development banks and finance institutions 2017, <http://documents.worldbank.org/curated/en/691741532976526194/pdf/129030-WP-Mobilization-of-Private-Finance-2017-PUBLIC.pdf> (last accessed April 3, 2019)

Mexico EDF; IETA (2018): Mexico. A market-based climate policy case study, https://www.ieta.org/resources/Resources/Case_Studies_Worlds_Carbon_Markets/2018/Mexico-Case-Study-Jan2018.pdf (accessed April 4th, 2019)

Michaelowa, Axel (2018): The Paris rulebook: missing pages after the Katowice decisions, Perspectives, Freiburg, https://www.perspectives.cc/fileadmin/Publications/Katowice_COP_Results_AM.pdf (accessed April 24, 2019)

Michaelowa, Axel (2009): Interpreting the additionality of CDM projects: Changes in additionality definitions and regulatory practices over time, in: Freestone, David; Streck, Charlotte (eds.): Legal aspects of carbon trading, Oxford University Press, Oxford, p. 248-271

Michaelowa, Axel; Butzengeiger, Sonja (2017): Ensuring additionality under Art. 6 of the Paris Agreement, Discussion Paper, Perspectives Climate Research, Freiburg

Michaelowa, Axel; Buen, Jorund (2012): The Clean Development Mechanism gold rush, in: Michaelowa, Axel (ed.): Carbon markets or carbon finance, Routledge, Abingdon, p.1-39

Mikolajczyk, Szymon, Brescia, Dario, Galt, Hilda, La Saché, Fabrice, Hunzai, Tobias, Greiner, Sandra, Hoch, Stephan (2016): Linking the Clean Development Mechanism with the Green Climate Fund: Models for scaling up mitigation action, Climate Focus, Amsterdam

OECD (2015): Climate finance in 2013-14 and the USD 100 billion goal: a report by the OECD in collaboration with Climate Policy Initiative, Paris

OECD (2017): Private finance for climate action: estimating the effects of public interventions, Policy perspectives, Paris

OECD (2018a): Climate finance from developed to developing countries: public flows in 2013-2017, Paris

OECD (2018b): DAC methodologies for measuring the amounts mobilised from the private sector by official development finance interventions: guarantees, syndicated loans, shares in collective investment vehicles, direct investment in companies, credit lines, September 2018, Paris, <http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-Methodologies-on-Mobilisation.pdf> (last accessed April 15, 2019)

Oxfam (2018): Climate finance shadow report 2018: assessing progress towards the \$100 billion commitment, https://www-cdn.oxfam.org/s3fs-public/file_attachments/bp-climate-finance-shadow-report-030518-en.pdf (last accessed April 3, 2019)

Pattberg, Philipp; Biermann, Frank; Chan, Sander; Mert, Aysem (2012):. Conclusions: partnerships for sustainable development, in: Pattberg, Philipp; Biermann, Frank; Chan, Sander; Mert, Aysem (eds.): Public-private Partnerships for Sustainable Development. Emergence, Influence and Legitimacy, Cheltenham: Edward Elgar, Cheltenham, p. 239-248

Pauw, Pieter; Chan, Sander (2018): Multistakeholder partnerships for adaptation: the role of micro, small and medium enterprises. In: Caroline Schaer, Natasha Kuruppu (eds.), Private-sector action in adaptation: Perspectives on the role of micro, small and medium size enterprises. UNEP DTU Partnership, Copenhagen, p. 98-109.

Pauw, Pieter; Bauer, Steffen; Richerzhagen, Carmen; Brandi, Clara; Schmole, Hanna (2014): Different perspectives on differentiated responsibilities: a state-of-the-art review of the notion of common but differentiated responsibilities in international negotiations, DIE Discussion Paper 6/2014, Bonn

PMR (2017): Establishing scaled-up crediting program baselines under the Paris Agreement: issues and options, World Bank, Washington

Polzin, Friedemann (2017): Mobilizing private finance for low-carbon innovation – A systematic review of barriers and solutions, in: Renewable and Sustainable Energy Reviews, 77, p. 525–535

Popp, David; Jaffe, Adam; Newell, Richard (2010): Energy, the environment, and technological change, in: Hall, Bronwyn; Rosenberg Nathan (ed.) Handbook of the Economics of Innovation, vol. 2, Elsevier, Amsterdam, p. 873–937

Rajamani, Lavanya (2016): Ambition and differentiation in the 2015 Paris Agreement: interpretative possibilities and underlying politics, in: International and Comparative Law Quarterly, 65, p. 493–514

Roadmap to US\$100 Billion (2016), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/562317/Roadmap_for_UK_website.pdf (last accessed April 4, 2019)

SBSTA (2018a): Draft text on SBSTA 49 agenda item 11(a). Matters relating to Article 6 of the Paris Agreement: Guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement. Version 2 of 8 December 10:00hs.

SBSTA (2018b): Draft text on SBSTA 49 agenda item 11(b). Matters relating to Article 6 of the Paris Agreement: Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement. Version 2 of 8 December 10:00hs.

Schneider, Lambert; Broekhoff, Derik; Fuessler, Juerg; Lazarus, Michael; Michaelowa, Axel; Spalding-Fecher, Randall (2012): Standardized Baselines for the CDM – Are We on the Right Track?, Policy Paper, Stockholm

Schneider, Lambert; Füssler, Jürg; La Hoz Theuer, Stephanie; Kohli, Anik; Graichen, Jakob; Healy, Sean; Broekhoff, Derik (2017): Environmental Integrity under Article 6 of the Paris Agreement; Umweltbundesamt, Berlin

Schneider, Lambert; La Hoz Theuer, Stephanie (2017): Using the clean development mechanism for nationally determined contributions and international aviation: assessment of impacts on global GHG emissions, Stockholm Environment Institute, Stockholm

Science-Based Targets initiative (2019): About the Science-Based Targets initiative, <https://sciencebasedtargets.org/about-the-science-based-targets-initiative/> (accessed April 9th, 2019).

Science-Based Targets initiative Technical Working Group (2018): SBTi criteria and recommendations. Version 3.0, 1-7, available at <https://sciencebasedtargets.org/wp-content/uploads/2017/02/SBTi-criteria.pdf> (accessed April 9th, 2019)

Shishlov, Igor; Bellassen, Valentin; Leguet, Benoit (2012): Joint Implementation: a frontier mechanism within the borders of an emissions cap. Climate Report N°33, CDC Climat Research, Paris

Shishlov, Igor; Bellassen, Valentin (2012): 10 lessons from 10 years of the CDM. Climate Report N°37, CDC Climat Research, Paris

Shishlov, Igor ; Bellassen, Valentin (2013) : Unlocking private investments in energy efficiency through carbon finance, Climate Brief N°27, CDC Climat Research, Paris

Spalding-Fecher, Randall, Michaelowa, Axel (2013): Should the use of standardized baselines in the CDM be mandatory?, in: Climate Policy 13, p. 80–88

Stadelmann, Martin ; Castro, Paula ; Michaelowa, Axel (2011a) : Mobilising private finance for low-carbon development: tackling barriers to investments in developing countries and accounting of private climate flows, Climate Strategies, <https://climatestrategies.org/wp-content/uploads/2011/09/cs-uzh-mobilising-private-finance-final.pdf>

Stadelmann, Martin; Michaelowa, Axel ; Roberts, J. Timmons (2013): Difficulties in accounting for private finance in international climate policy, in: Climate Policy 13, p. 718-737

Stadelmann, Martin; Roberts, J. Timmons ; Michaelowa, Axel (2011b) : New and additional to what ? Assessing options for baselines to assess climate finance pledges, in: Climate and Development 3, p 175-192

Stumhofer, Tim, Detken, Annette, Harnisch, Jochen, Lueg, Barbara (2015): Proposal of a methodology for tracking publicly mobilized private climate finance, KfW Development Bank Materials on Development Financing No. 9, KfW, Frankfurt:

Subbaro, Srikanth (2011): Role of Private Sector, Consultants and Project Owners in CDM approval and promotion. Available online: <http://www.acp-cd4cdm.org/media/247365/roleprivatesectorcdmapprovalpromotion.pdf> (accessed April 9th 2019)

Sylvester, Bianca (2014), Pilot Auction Facility for Methane and Climate Change Mitigation, World Bank Group, https://unfccc.int/sites/default/files/05_world_bank_bianca_sylvester.pdf (last accessed April 16, 2019)

Szulecki, Kacper; Pattberg, Philipp; Biermann, Frank (2012). Partnerships for Sustainable Development in the Energy Sector: Explaining Variation in their Problem-Solving Effectiveness, in: Pattberg, Philipp; Biermann, Frank; Chan, Sander; Mert, Aysem (eds.): Public-private Partnerships for Sustainable Development. Emergence, Influence and Legitimacy Edward Elgar, Cheltenham, p. 88-112.

Torres, Camila; Fermam, Ricardo; Sbragia, Isabel (2016): CDM projects in Brazil: Market Opportunity for Companies and New Designated Operational Entities, in: Ambiente & Sociedade, 19, p. 199-212

UN (2010b): Report of the secretary-general's high-level advisory group on climate change financing, United Nations, New York

UNDP Vietnam; USAID; Vietnam Ministry of Planning and Investment; Vietnam Ministry of Finance (eds.) (2018): Opportunities for carbon pricing in Vietnam, UNDP Vietnam, Hanoi

UNEP DTU (2019): CDM pipeline, www.cdmpipeline.org, (last accessed May 30, 2019)

UNFCCC (2018): 2018 biennial assessment and overview of climate finance flows, Technical Report by the UNFCCC Standing Committee on Finance, Bonn

UNFCCC (2018a): Decision 8/CMA.1, Matters relating to Article 6 of the Paris Agreement and paragraphs 36-40 of decision 1/CP.21, in: FCCC/PA/CMA/2018/Add.1

UNFCCC (2018b): Decision 18/CMA.1, Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement, in: FCCC/PA/CMA/2018/3/Add.2

UNFCCC (2018c): FCCC/CP/2018/L.24 advance version. Draft decision -/CMA.1. Guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement. Preparations for the implementation of the Paris Agreement and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement - Proposal by the President.

UNFCCC (2018d): FCCC/CP/2018/L.25 advance version. Draft decision -/CMA.1. Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement. Preparations for the implementation of the Paris Agreement and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement - Proposal by the President.

UNFCCC (2018e): III. Matters relating to Article 6 of the Paris Agreement and paragraphs 36-40 of decision 1/CP.21. In: The Katowice text: Proposal by the President

Weikmans, Romain; Roberts, Timmons (2019: The international climate finance accounting muddle: is there hope on the horizon?, in: Climate and Development, 11, p. 97-111

Whitely, Shelagh ; Thwaites, Joe ; Wright, Helena; Ott, Caroline (2018): Making finance consistent with climate goals, Overseas Development Institute, World Resources Institute, Rocky Mountain Institute, E3G, <https://www.odi.org/sites/odi.org.uk/files/resource-documents/12557.pdf> (last accessed April 3, 2019)

World Bank; Ecofys; Vivid Economics (2017): State and trends of carbon pricing 2017, World Bank, Washington D.C.



Perspectives

Climate Group GmbH
Hugstetter Str. 7
79106 Freiburg, Germany
info@perspectives.cc
www.perspectives.cc