

# Six lessons on carbon accounting for Article 6 of the Paris Agreement

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## SUMMARY

As the Paris Agreement enters into force on 4 November 2016, countries will start negotiating technical provisions for its implementation. One of the key points will be the rules for carbon accounting under Article 6 that provides for the possibility of international transfers of mitigation outcomes (ITMOs). However, given the currently insufficient ambition of the sum of countries' mitigation pledges and the resulting 'hot air' against the 2°C trajectory, the carbon accounting framework under Article 6 must take into account key lessons from past experience. Article 6 could greatly benefit from building upon the successes and failures of the CDM and JI at all stages of the monitoring, reporting and verification (MRV) process. Furthermore, the new flexibility mechanism(s) must avoid the mistakes of the CDM and JI that led to compromised environmental integrity in some cases. Moving forward, a stringent, yet flexible, carbon accounting system is pivotal to ensuring the environmental integrity and the contribution of Article 6 to achieving the objectives of the Paris Agreement.

## Background: Article 6 carbon accounting should build upon the Kyoto experience

The Paris Agreement on climate change, adopted during COP21 in December 2015, enters into force on 4 November 2016 after ratification by more than 55 States responsible for more than 55% of global greenhouse gas (GHG) emissions. Unlike the Kyoto Protocol that was initially geared for international carbon trading, the Paris Agreement does not currently incorporate mandatory quantified annual reduction targets and corresponding emissions allowances

for Parties. At the same time, all Parties must regularly submit their decarbonization strategies dubbed 'Nationally Determined Contributions' (NDCs). These NDCs, can, but are not required to, include quantified emissions reduction targets.

Article 6 of the Paris Agreement nevertheless provides the possibility of voluntary *international transfers of mitigation outcomes* (ITMOs), i.e. reductions or sinks of GHG emissions, from one country to another (Bultheel et al. 2015). In principle, Article 6 is similar to Articles 6 and 12 of the Kyoto Protocol: Joint Implementation (JI) – for countries with quantified NDCs – or the Clean Development Mechanism (CDM) – for countries without quantified NDCs. After ratification, discussions will begin focusing on the technical aspects of potential new flexibility mechanisms under Article 6. Most notably, according to Article 6.7, rules, modalities and procedures for the mechanism under article 6.4 must be established at the first meeting of the Parties to the Paris Agreement during the 22<sup>nd</sup> Conference of Parties to the UNFCCC (COP22) in Marrakech.

While Article 6 may include a broader set of instruments beyond project crediting, such as sectoral policy support, the CDM and JI accounting rules provide a good starting point for the new monitoring, reporting and verification (MRV) framework. Regardless, however, of the form the flexibility mechanism(s) will take under Article 6, the MRV system will need to be established in order to quantify and track internationally transferrable mitigation outcomes.

Past experience from existing carbon accounting frameworks offers useful lessons to be taken into account. Specifically, the CDM includes seven quality criteria: additionality, baseline setting, monitoring, verification, transparency, timeline and permanence (Shishlov and Bellassen 2012). In addition to these criteria, two other important MRV challenges have to be considered, namely governance and, finally, transaction costs. This policy brief discusses these issues and draws six key lessons from the CDM and JI experience to inform upcoming discussions around the carbon accounting framework under Article 6 of the Paris Agreement.

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## Lesson 1: additionality and ambitious baselines for crediting need to be ensured given the insufficiency of current mitigation ambition to stay “well below 2°C”

Carbon crediting mechanisms, such as the CDM and JI, essentially represent an environmental ‘zero-sum’ game: the emissions reductions generated can be used for compliance elsewhere. Therefore, in order to ensure that the overall magnitude of GHG abatement does not decrease, the Kyoto Protocol stipulated that to be certified under the CDM emissions reductions had to be ‘real, measurable and additional to any that would occur in the absence of the certified project activity’ (UN 1998). This concept, referred to as ‘additionality’, is central to ensuring the environmental integrity of carbon crediting. It is essential that it is incorporated in modalities for Article 6 of the Paris Agreement, with three sub-issues explored here.

First, the principal difficulty of evaluating additionality is assessment of alternative hypothetical scenarios or ‘baselines’ to which real world observations are compared. Given that these scenarios will never materialize if a project/policy is implemented, additionality can never be established with 100% certainty – even ex-post. Too lenient a baseline might result in non-additional emissions reductions being credited thus reducing overall ambition. Conversely, an overly-stringent baseline considerably lower than the actual business-as-usual (BAU) may deter participation in the scheme due to insufficient economic incentive (Bellassen and Shishlov 2016).

Second, in a system where Parties have quantified emissions reduction targets, such as in the case of JI, the issue of additionality becomes a question of economic efficiency rather than environmental integrity. Indeed, non-additional JI projects will free-ride on the mechanism, and may thus receive windfall profits from carbon certificates. This phenomenon effectively reduces the amount of emissions reductions per dollar invested, but *strictu sensu* does not compromise the overall progress towards achieving emission reduction targets. Indeed, the JI scheme incorporates an economic incentive to ensure additionality: if a government spends part of its carbon budget to subsidize a non-additional project, it will have to make up for the resulting deficit by paying to reduce emissions elsewhere. While this incentive worked well for countries with ambitious emissions reduction targets – such as Germany and France – it appears not to have worked for countries with lax objectives – such as Russia

and Ukraine (Kollmuss, Schneider, and Zhezherin 2015). Today, the additionality of crediting mechanisms under Article 6 may be similarly compromised in case of countries with less ambitious NDCs (Schneider, Kollmuss, and La Hoz Theuer 2016).

Third, the development of the Program of Activities (PoA) framework under the CDM – as well as new sectoral crediting mechanisms that avoid project by project additionality demonstration – may help partially solve the issue and foster scaling up of projects. Notably, positive lists of eligible projects used by the CDM provide a good basis for further standardization independent of the level of the relative ambition of national climate policy. The list of projects automatically deemed additional under the CDM currently includes small scale off-grid and grid-connected renewable energy; rural electrification project activities using renewable energy sources in countries with rural electrification rate of less than 20%; mass transit and bus lane in Least Developed Countries (LDCs); among others. Moreover, several CDM methodologies already apply standardized performance benchmarks defining the baseline as the average of the top 20% of installations in a given sector (Shishlov and Bellassen 2012). Thus, certain types of projects that are deemed aligned with the goals of the Paris Agreement could be accepted automatically and assigned a standardized, conservative amount of credits per operation period. The baseline and additionality would therefore be evaluated against the trajectory towards the ‘net zero’ emissions target rather than a given country’s NDC.

It can therefore be envisaged that an Article 6 MRV system could use the experience of the CDM and introduce positive lists and programmatic approaches in order to scale up the mechanism. Moreover, the use of conservative standardized, country- and sector-specific baselines could reduce risks of over-crediting due to insufficiently ambitious NDCs – as well as reduce MRV-related transaction costs.

The issue of additionality and free-riding becomes even more important in sectors with relatively ‘good’ access to finance where it makes more sense to focus on projects with the highest leverage ratios (emission reductions per dollar invested). Conversely, in contexts where sectors lack access to finance, a less-stringent screening may be applied in order to kick-start project development. This may effectively lead to some form of ‘*statistical additionality*’, whereby non-additional emissions reductions are balanced out by emissions reductions that are under-credited.

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## Lesson 2: managing timeline and permanence of emissions reductions under Article 6 is critical given the implicit need for carbon sinks under the Paris Agreement

In carbon offset projects credits are typically issued for the emissions reductions achieved, i.e. ex-post. This is a common practice due to the numerous factors that can influence actual emission reductions over the project crediting period and that are difficult to calculate precisely ex-ante. As such, it stands to reason that the issuance of carbon credits would occur only after the emission reductions have taken place and have been verified. However, in sectors that are potential providers of large-scale carbon sinks, such as forestry and agriculture, emission reductions accumulate slowly over time and future carbon credits may not justify the initial investments in a project. The Paris Agreement puts an implicit emphasis on carbon sinks with an ultimate objective of achieving “a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century”. While important for ensuring environmental integrity, ex-post issuance of credits may thus hamper the implementation of projects aimed at absorbing CO<sub>2</sub>.

Second, emissions reductions credited under international flexibility mechanisms have to be permanent. This may not be the case for forestry projects, which may only issue temporary carbon credits under the CDM that are valid for a limited period (Guigon, Bellassen, and Ambrosi 2009). Conversely, forestry projects under voluntary offset standards typically establish a ‘buffer’ of carbon credits that are used as ‘insurance’ in case carbon stocks are destroyed, e.g. by a forest fire. A similar issue may arise in projects focused on carbon capture and storage as there is no guarantee that CO<sub>2</sub> will not escape in the atmosphere in the future. Carbon accounting provisions under Article 6 will need to incorporate similar safeguards to mitigate this risk.

## Lesson 3: the carbon accounting framework for Article 6 should take flexible approaches to account for monitoring uncertainty

The implementation of monitoring rules prescribed by the regulator comes with an uncertainty range: the exact amount of GHG emissions differs from the amount reported by an agent (Bellassen et al. 2015). This monitoring uncertainty stems from systematic errors (bias) and/or random errors. In order to address uncertainty, the regulator

may, for example, set a minimum certainty threshold; allow the agent to choose between measuring a value and using a default parameter; or discount the benefits of emissions reductions in proportion to uncertainty (Bellassen and Shishlov 2016). Under the CDM, project developers have to “reduce bias and uncertainties as far as is practical/cost-effective, or otherwise use conservative assumptions, values and procedures to ensure that GHG emission reductions by sources or GHG removals by sinks are not over-estimated” (CDM-EB65-A05-STAN). The same principle is applied to baselines: “the establishment of a baseline is considered conservative if the resulting projection of the baseline does not lead to an overestimation of emission reductions attributable to the CDM project activity” (CDM-EB66-A25-GUID).

The MRV system for Article 6 could build upon the CDM experience and provide a certain degree of flexibility to developers in order not to impede projects in sectors where a high level of monitoring certainty cannot be achieved or is too costly, e.g. transportation, agriculture or forestry. This may be done through providing an explicit incentive to reduce uncertainty by discounting the amount of carbon credits in proportion to the overall monitoring uncertainty. Projects that are able to provide better information are thus encouraged to do so, while others may choose to save on monitoring costs at the expense of less carbon credits awarded. In a voluntary scheme, discounting the amount of carbon certificates in proportion to the overall monitoring uncertainty will allow projects with high levels of monitoring uncertainty access the system without imposing prohibitory MRV costs (Bellassen and Shishlov 2016).

## Lesson 4: auditors accredited by the UNFCCC can be used for verification of ITMOs under Article 6, but their accountability has to be ensured

Three lessons on verification from existing crediting mechanisms should be taken into consideration to ensure accountability while keeping transaction costs in check.

First, as project developers are likely to have private information to calculate the amount of emissions reductions, the data they provide has to be verified by an auditor. In the CDM system an auditor accredited by the UNFCCC must periodically verify the consistency between project description and the relevant methodology to compute emissions reductions, known as the monitoring plan, and the correct implementation of the project. A similar verification approach is applied in most carbon accounting systems, be it national GHG inventories or an ETS.

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However, as the third party tends to be paid directly by the verified entity, a potential conflict of interest arises. In most cases, the risk of losing the accreditation is a much stronger incentive and usually keeps auditors from being complacent with their client (Cormier and Bellassen 2012). Thus, auditors that validate mitigation outcomes under Article 6 should be suspended if they breach the rules – as was already done in the case of the validation of non-additional projects under the CDM (Shishlov and Cochran 2015).

Second, in order to keep verification costs at a reasonable level, the stringency of verification is adapted to the importance of information at stake via the concept of ‘materiality’. Auditors are encouraged to focus on larger sources of potential overestimations – while small sources of errors may be ignored. In the CDM, the threshold of materiality depends on the size of the project and ranges from 10% of total emissions reductions for micro-scale projects (renewable energy projects of up to 5 MW and energy efficiency projects of up to 20 GWh of energy savings per year) to 0.5% for large scale projects that reduce more than 500,000 tons of carbon dioxide equivalent per year (Shishlov and Bellassen 2015).

Article 6 could employ a similar approach to verification of emission reductions, whereby auditors focus on larger sources of potential errors using the concept of materiality. Another potential approach that may be considered is the ‘fire alarm’, i.e. the auditor conducts random spot-checks and focuses on ‘suspicious’ numbers. However, in this case the auditors will probably have to be paid from an aggregated pool of resources, since the risk of a conflict of interest would be higher.

Finally, entities that are already accredited for verification under the UNFCCC may be automatically allowed in the new scheme, effectively removing the costs related to accreditation while ensuring international recognition.

### **Lesson 5: striking a balance between decentralized governance and an overarching authority is needed to ensure participation and integrity**

On one hand, mechanism governance can be highly centralized: the CDM Executive Board is the main governing body responsible for all technical elements of the CDM including the validation of methodologies, the accreditation of auditors, the registration of projects and the issuance of CERs. The Executive Board counts 10 members and 10 alternate members representing different regions and is supported by several panels and staff from the UNFCCC.

On the other hand, governance can be decentralized: the JI provided a window for country-level administration through the so-called Track 1. This, however, led to allegations of excessively lax MRV procedures in countries with ‘hot air’ – notably Ukraine and Russia – that flooded the carbon market with credits at the end of the first Kyoto commitment period (Kollmuss, Schneider, and Zhezherin 2015). Having a central overarching authority may therefore be an important factor in ensuring credibility and transparency of the flexibility mechanism(s) under Article 6.

The bottom-up nature of the Paris Agreement and countries’ NDCs affirms that national governments are sovereign in deciding on their climate policies with little top-down oversight. At the same time, coordination and/or oversight may be needed when individual domestic choices impact the effectiveness of joint international mechanisms (Shishlov and Cochran 2015). The currently insufficient ambition of countries’ mitigation pledges to reach long-term shared objectives (UNFCCC 2015) results in the risk of ‘hot air’ against the 2°C trajectory. Similar to the ‘hot air’ issue under the Kyoto Protocol, this may result in non-additional ITMOs further compromising the ambition of national decarbonization targets. Given the JI experience, certification and accounting for ITMOs should remain under the authority of the UNFCCC. Until countries ratchet up their mitigation pledges to match the objectives of the Paris Agreement, the international supervision of flexibility mechanisms under Article 6 appears warranted.

### **Lesson 6: Article 6 will need to strike a balance between costs and stringency, as transaction costs vary greatly among different sectors**

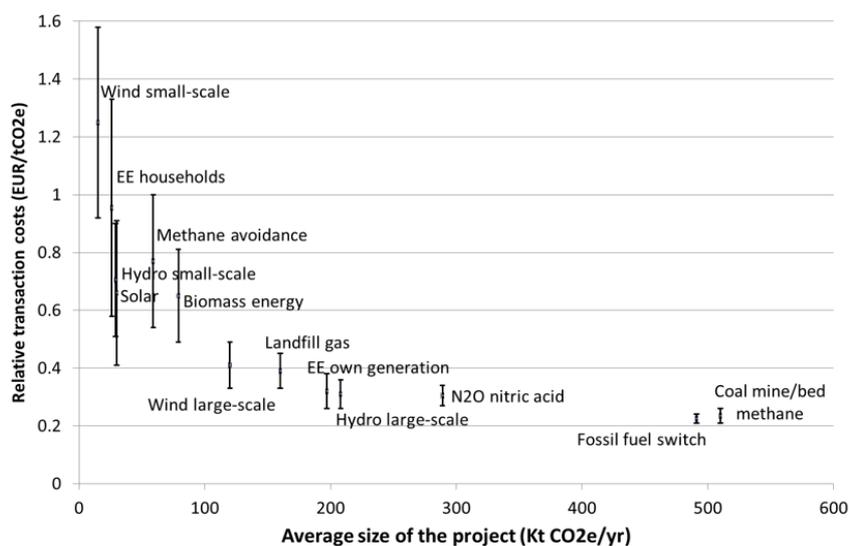
Finally, the issue of transaction costs can greatly influence the success – or failure – of any mechanism. The experience with the CDM and other carbon pricing mechanisms demonstrates that these costs may vary drastically depending on the sector and the perimeter of scheme. These costs are largely determined by the scale effect: more comprehensive schemes covering large numbers of entities tend to have lower transition costs. Indeed, MRV costs may range from a fraction of a cent per ton of CO<sub>2</sub> for national inventories to one euro and above for small-scale carbon offset projects (Bellassen and Stephan 2015). However, even within a single carbon pricing mechanism smaller entities tend to bear over-proportionally high MRV costs. Following the materiality principle, MRV rules often contain provisions to reduce the amount of resources spent on accounting for smaller emissions sources. These provisions

are, however, not enough to counterbalance the economies of scale that reduce relative MRV costs for larger entities or projects (Figure 1).

Upfront transaction costs borne by CDM project developers include Project Design Document (PDD) development, validation costs (internal and auditing), UNFCCC registration fees and the cost of installing the monitoring system. Periodic MRV costs include the actual monitoring of emissions reductions, accounting and verification. Projects may reduce verification costs per tCO<sub>2</sub>e by increasing the duration of monitoring periods and decreasing the frequency

of reporting. Additionality demonstration and baseline setting represent half of upfront transaction costs in the CDM (Guigon, Bellassen, and Ambrosi 2009). Significant reduction in transaction costs can therefore be envisaged if standardization of additionality and baseline setting and abandoning project-by-project assessment were integrated in the rules for Article 6. More generally, the provisions under Article 6 will need to strike a balance between MRV costs and stringency in order to avoid the situation currently faced by the CDM, where for many project types transaction costs are higher than the potential revenue from carbon credits.

Figure 1 – MRV costs in the CDM



Source: Shishlov and Bellassen (2015)

## Conclusion: do not reinvent the wheel, do not repeat the old mistakes

A stringent, but flexible, MRV system is pivotal to mitigating the risk of future carbon crediting mechanisms compromising the ambition of the Paris Agreement. Namely, demonstrating additionality of projects and setting stringent emissions reduction baselines serve as the main tools to safeguard environmental integrity of the mechanism, especially given the insufficient ambition of current NDCs to reach long-term mitigation objectives. The new MRV framework will have to strike a balance between removing barriers – i.e. high transaction costs associated with more stringent MRV – and increasing economic efficiency – i.e. the amount of emissions reduced per dollar invested.

Article 6 may greatly benefit from building upon the CDM and JI experience at all stages of the MRV process without the need to reinvent the wheel. Indeed, the new mechanism

can considerably reduce time and costs to set up the MRV system by using existing UNFCCC tools and infrastructure. This includes positive lists and standardized baselines, sector-specific monitoring methodologies, accredited auditors, etc.

At the same time, the new flexibility mechanism(s) must avoid the mistakes of the CDM and JI that led to compromised environmental integrity in some projects. The currently insufficient ambition of countries' mitigation pledges results in 'hot air' against the 2°C trajectory, similar to the 'hot air' issue under the Kyoto Protocol. Given the JI experience, certification and accounting for 'internationally transferred mitigation outcomes' should therefore remain under the authority of the UNFCCC. Ultimately, it is essential to remember that the contribution of Article 6 to achieving the objectives of the Paris Agreement will depend upon ratcheting up the ambition of NDCs.

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