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# Establishing Scaled-Up Crediting Program Baselines under the Paris Agreement: Issues and Options


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# Acknowledgments

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# Executive Summary

**T**he Paris Agreement promises a new era in international cooperation on climate change, but also poses new challenges for countries seeking to cooperate. Article 6 of the Paris Agreement allows for the creation of mechanisms that would enable countries to support greenhouse gas (GHG) abatement in other countries, either through "nonmarket" climate finance, or the use of market mechanisms that allow the international transfer of mitigation outcomes. In principle, the latter mechanisms could take a variety of forms, including traditional crediting programs focused on mitigation projects or programs (as under the Kyoto Protocol's Clean Development Mechanism), but potentially also new forms of crediting, including *scaled-up* approaches that credit aggregate mitigation outcomes achieved across large numbers of sources. At the same time, the Paris Agreement established a new playing field, where every country has proposed climate change mitigation actions in the form of "nationally determined contributions" (NDCs). For countries contemplating new market-based approaches to international cooperation, a key question is how to navigate this new global policy landscape.

This technical note is one of a planned series of notes offering guidance and identifying options related to developing scaled-up crediting programs. The focus of this technical note is on baseline development, in particular how to develop baselines consistent with rules that may arise for international crediting (or other forms of emissions trading or transfers) under the Paris Agreement. In principle, the baseline for a crediting program should represent the GHG emissions that would occur over a specified period of time in the program's absence, taking into account a range of factors — including domestic policies — that might influence those emissions. The baseline thus establishes the reference level(s) of emissions used to quantify the GHG reductions the program generates over time. One fundamental question is whether and how NDCs should be reflected in a crediting program's baseline.

Detailed rules related to baselines under the Paris Agreement, including under Article 6, are still being determined. However, two general principles identified in the Agreement are highly relevant for baseline development and point to some general approaches that can be taken in the near term. The first is the principle of *environmental integrity.* Under the Paris Agreement, countries may cooperate to achieve their NDC targets by transferring mitigation outcomes (e.g., a country that overachieves against its NDC target may transfer its excess mitigation to a country that domestically underachieves, allowing both countries to meet their targets). The principle of environmental integrity is not formally defined in the Paris Agreement, but in general it can be interpreted to mean that crediting mechanisms (and other forms of international cooperation) should not result in higher global emissions than if countries' NDCs had been achieved only through domestic action. Closely related to environmental integrity is the principle of *avoiding double counting.* This principle implies that no two countries can count the same mitigation outcome toward their respective NDCs.

At least two implications arise from the need to ensure environmental integrity and avoid double counting. The first is that countries engaged in transferring mitigation outcomes will likely need a consistent framework for evaluating the effect of transfers on the achievement of their respective NDC targets — e.g., subtracting an outcome from the progress reported by the transferring country, and adding it to the progress of the recipient country. To date, such frameworks have been based on using a common metric for GHG emissions accounting (e.g., $tCO_2e$), and international rules may ultimately require that

countries express both *baselines and NDC targets* in terms of explicit GHG emission pathways (i.e., emission levels over time) in order to transparently account for the effect of transfers.

The second implication is that a country may bear some risk if it chooses to host a crediting program. This is because the country cannot count transferred mitigation outcomes (e.g., in the form of credited GHG reductions) toward its own NDC if they are used by the acquiring country for NDC achievement. The host country must therefore ensure that it does not *over-transfer* emission reductions and jeopardize the achievement of its NDC.

Whether over-transferring is a concern depends on whether the GHG sources covered by a crediting program are also covered by its NDC. If a crediting program covers only sources *outside* the coverage of a country's NDC, then transferring GHG reductions generated from these sources will not compromise the country's ability to reach its current NDC target (though it could affect plans to expand the coverage of its NDC, and to move over time to an economy-wide NDC target). The baseline for such a program may be established using methods to estimate "business-as-usual" (BAU) emissions — or levels below BAU — with the goal of ensuring environmental integrity (Table ES-1). However, care is needed to account for possible indirect interactions between mitigation activities at sources covered by the crediting program and those at sources covered by the NDC.

For crediting programs covering sources that are included *within* a country's NDC targets (which is the only option for countries with economy-wide targets) there is a risk of over-transferring. This risk can be managed through a combination of different approaches to baseline setting and/or restricting the transfer of GHG reductions (Table ES-1). Possible approaches include:

1. *Establish a business-as-usual **(BAU)** baseline and transfer only part of the verified GHG reductions, so that the remainder may be used by the host country toward its NDC achievement.* Under this approach, the baseline would be defined as a continuation of current trends and policies (i.e., BAU) (Figure ES-1). This would allow all GHG reductions achieved at sources covered by the crediting program to be potentially credited. However, some of these reductions could be needed to demonstrate achievement of the host country's NDC targets.[1] Thus, the host country could *transfer* only some of the reductions and withhold the remainder, to ensure that its NDC targets are met. This approach could be implemented in a number of ways, including withholding a fixed *ex ante* percentage of reductions, or by making *ex post* determinations based on a comparison of its actual GHG emissions to its NDC target. One advantage of this approach is that it could allow the initiation of a crediting program before a country has translated its NDC targets into discrete GHG emissions pathways (although such translation would ultimately be necessary to reconcile transfers with NDC targets).

2. *Establish a **below-BAU** baseline.* Under this option, the baseline could be defined using a variety of methods and assumptions, including by modeling the effects of new policies or by using an emissions benchmark for covered GHG sources. As with a BAU baseline, this could allow the initiation of a crediting program before a country has translated its NDC targets into discrete GHG emissions pathways for different sectors. However, this could result in a baseline that is either above or below the emissions pathway ultimately derived for the sources covered by the crediting program, with differing implications for over-transfer risk.

1 This would be the case unless the country overachieves against NDC targets at sources *not* covered by the crediting program.

a. If the baseline, despite being below-BAU, is nevertheless *above* an NDC-derived emissions pathway, then the host country may still need to withhold a portion of GHG reductions to ensure its NDC targets are met. However, because fewer reductions would be quantified under this approach than under a BAU baseline, the quantity withheld — and the associated risk of over-transfer — would be reduced (Figure ES-2).

b. If the below-BAU baseline falls *below* an NDC-derived emissions pathway, then all quantified GHG reductions could be transferred and over-transfer risk would be minimized. However, the host country would forego the opportunity to transfer GHG reductions that are below the NDC-derived emissions pathway but above the baseline (Figure ES-3). This could reduce the amount of revenue generated by the crediting program. At the same time, the quantity not transferred could be used to insure against the risk of underachievement of NDC targets in other sectors.

3. *Establish a baseline* ***derived from NDC targets.*** This approach would aim to ensure that only GHG reductions beyond those needed to achieve a country's NDC would be credited and made available for transfer (Figure ES-4). This would greatly reduce the risk of over-transferring GHG reductions, while at the same time maximizing the quantity of credited reductions that could be transferred.[2] However, it requires having clarity about how the country's NDC targets will affect GHG emissions at sources covered by the crediting program. This could be a challenge for many countries, given that many NDCs are not currently defined in terms of discrete GHG emissions pathways specific to particular sectors or groups of sources.

Each of these options has advantages and disadvantages. The choice may depend on a range of factors, including the current level of clarity and planning around NDC implementation and its implications for GHG emissions; credit buyer preferences and risk tolerance; and considerations about the needed structure and certainty for market participants.

Two qualifications related to these approaches are important to note. First, Article 6.4 of the Paris Agreement introduces a new, centrally coordinated mechanism for facilitating international cooperation on mitigation efforts. Article 6.4(d) stipulates that this mechanism should achieve an "overall mitigation in global emissions." One possible interpretation of this is that global GHG emissions should be *lower* when the mechanism is used, compared to a situation where Parties would achieve their NDCs without using the mechanism (in contrast to the environmental integrity principle, which suggests only that emissions should *not be higher*). This may have implications for how scaled-up crediting program baselines are set. For example, a lower global emissions outcome could be achieved if a *below-BAU* baseline is adopted for crediting programs outside the coverage of an NDC target (Table ES-1), or if a *below-NDC* baseline is adopted for crediting programs within the coverage of an NDC target (e.g., as illustrated in Figure ES-3). Alternatively, a lower global emissions outcome could be achieved by *withholding additional transfers,* i.e., by transferring fewer reductions than indicated by the dark-shaded areas in Figures ES-1, ES-2, and ES-4. Although this technical note is primarily concerned with baseline and accounting approaches that ensure environmental integrity, the "overall mitigation" principle may be important to consider for crediting programs that are developed to be consistent with Article 6.4.

Second, for crediting programs covering sources that are within a country's NDC target, the risk of over-transfer will arise only as long as the NDC target is "ambitious," which we define here as any

2 Over-transfer could still occur if the host country fails to achieve its NDC targets at sources *not covered by the crediting program*.

**FIGURE ES-1. Example of using a BAU baseline and restricting GHG reduction transfers**

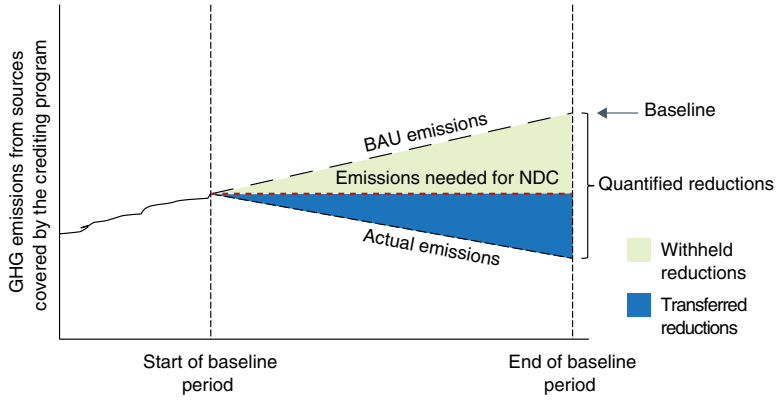



**FIGURE ES-2. Example of using a below-BAU baseline that is above NDC target emissions**

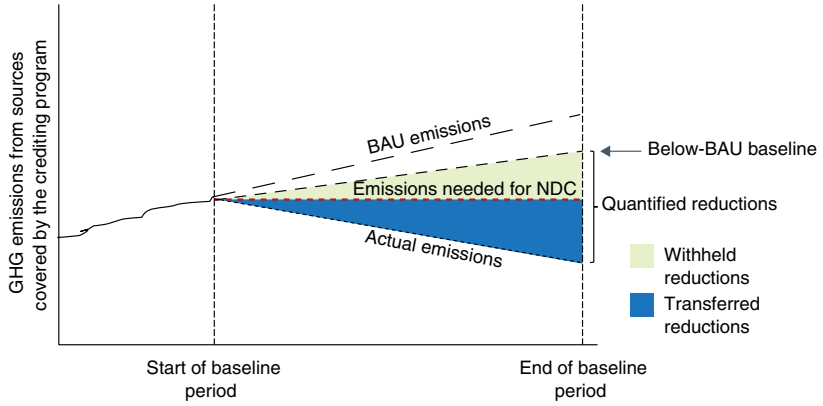



**FIGURE ES-3. Example of using a below-BAU baseline that is below NDC target emissions**

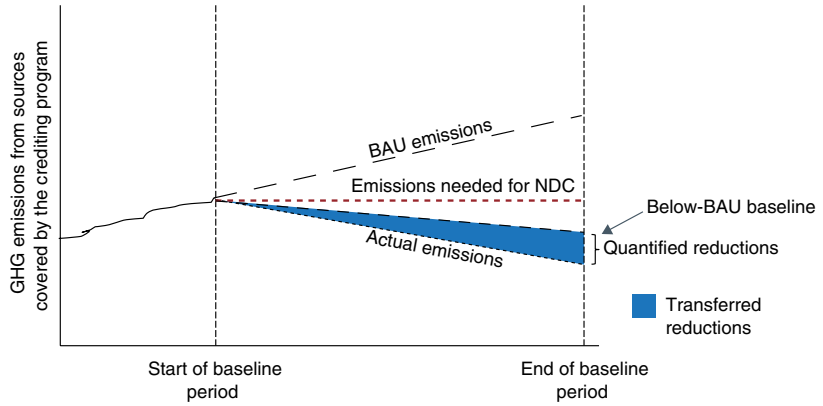



**FIGURE ES-4. Example of using an NDC-derived baseline**

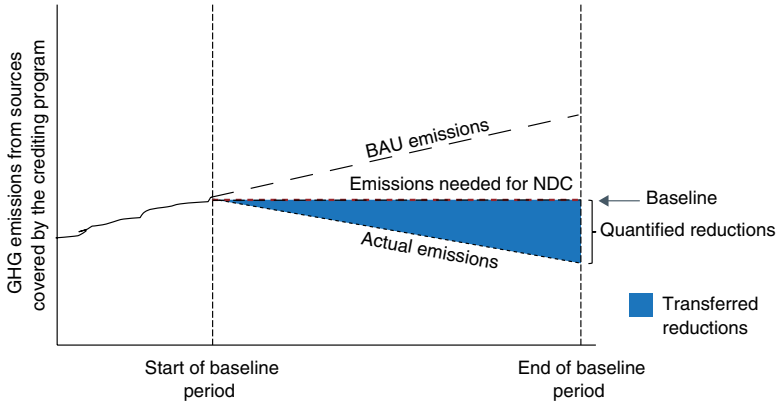


**TABLE ES-1. Possible baseline approaches for scaled-up crediting programs, depending on coverage, and approaches for managing over-transfer risk**

| Location of Sources | Baseline Approaches | | | |
|---|---|---|---|---|
| | **NDC-derived** | **BAU** | **Below BAU–above NDC** | **Below BAU–below NDC** |
| **Inside NDC** | • Low over-transfer risk<br>• Maximizes transferable reductions<br>• Requires translating NDC into discrete GHG emissions pathway | • Avoids immediate need to translate NDC into discrete GHG emissions pathway<br>• Maximizes transferable reductions<br>• Requires careful management of transfers | • Avoids immediate need to translate NDC into discrete GHG emissions pathway<br>• Maximizes transferable reductions<br>• May help reduce over-transfer risk | • Avoids immediate need to translate NDC into discrete GHG emissions pathway<br>• Lowest over-transfer risk<br>• Reduces transferable reductions<br>• May help achieve "overall mitigation" |
| | **NDC-Derived** | **BAU** | **Below BAU** | |
| **Outside NDC** | • N/A | • Minimum condition for ensuring environmental integrity | • Provides greater assurance of environmental integrity<br>• May help achieve "overall mitigation" | |

target that is below BAU emissions.[3] Countries with *unambitious* targets (i.e., those above BAU emissions levels) could transfer GHG reductions without compromising their ability to achieve their targets — even if the reductions were quantified using an inflated baseline. This is because, even if the country fails to *actually* reduce emissions below BAU levels, it will still be able to achieve its unambitious NDC target, as long as the sum of any transfers plus its actual emissions does not exceed the target. As other analyses have indicated, this could undermine environmental integrity at the global level, even if double counting is avoided following the baseline and transfer restriction approaches described above.[4] The analysis in this technical note presumes that countries hosting scaled-up crediting programs will have ambitious NDCs. However, both host countries and countries receiving transfers may need to consider the environmental integrity risks associated with unambitious NDCs, and negotiate appropriate terms, baseline definitions, and quantification methods accordingly.[5]

Regardless of which approach to baseline development is chosen, an important near-term task may be to further clarify how a country's NDC targets translate into a GHG emissions pathway for the sources covered by a scaled-up crediting program (i.e., determining the red dotted lines in Figures ES-1–ES-4). A number of strategies can be deployed here, depending on how a host country has formulated its NDC, and the tools it has available for translating NDC targets into a sectoral emissions pathway.

Another important consideration for scaled-up crediting program baselines is the length of time over which they can be used to quantify GHG reductions and generate credits (i.e., their "crediting period"). This may be determined in part by plans for updating, increasing the ambition of, and expanding the coverage of NDC targets over time, as called for under Article 4 of the Paris Agreement. In general, it will be important to coordinate crediting program development and NDC planning, including by involving the same agencies and ministries responsible for NDC definition and implementation.

3 For the purpose of defining ambition here, we refer to a hypothetical "true" or "actual" BAU emissions trajectory, not necessarily what a country has defined as BAU for the purpose of setting its NDC target. One challenge for participants in international transfers may be to agree on standard methods and metrics for assessing BAU emissions; such methods are beyond the scope of this technical note.

4 See, for example, Schneider et al. (2017).

5 One implication, for example, could be that only baselines set at or below BAU emissions levels (approaches #1 or #2b, above) would preserve environmental integrity. However, a variety of conditions or approaches could be adopted to accommodate crediting in the context on unambitious NDC targets, beyond the scope of baseline setting. We do not address these here.

Finally, there are several outstanding questions related to scaled-up baselines that will need to be further explored as countries proceed with the development of crediting programs (scaled-up, or otherwise) under the Paris Agreement. These include:

- How to consider "conditional" NDC pledges, the role of crediting and carbon finance in achieving them, and what this means for baselines?
- How to establish baselines where both climate finance and carbon finance are combined to achieve mitigation targets?
- What might be the specific methodological or procedural requirements for developing baselines under different Article 6 mechanisms?

# 1 Introduction

This technical note has been prepared as part of the development of a new upcoming PMR guidance on crediting and offsetting instruments of climate policy. The focus of this technical note is on baseline development for scaled-up crediting programs, in particular how to develop baselines consistent with rules that may arise for international crediting (or other forms of emissions trading or transfers) under the Paris Agreement.

The baseline is a critical element of any scaled-up crediting program, since it is one of the factors that determines the quantity of GHG reductions that may be credited and used to generate revenue. However, determining an appropriate baseline requires careful attention to evolving rules around international cooperation under Article 6 of the Paris Agreement. In particular, scaled-up crediting program baselines can play a role in upholding the principle of environmental integrity, and in helping to manage risks arising from the requirement to avoid double counting, while enabling cost-effective mitigation and facilitating higher mitigation ambition. A critical question is how to proceed with baseline development in light of uncertainties related to both the international rules and how a scaled-up crediting program may interact with a country's climate change policies and targets associated with its "nationally determined contribution" (NDC).

This technical note is intended to provide some preliminary answers and options. Section 2 provides a **working definition of scaled-up crediting** and how it differs from other forms of GHG emissions crediting that have been implemented to date, along with basic **concepts and definitions** related to **scaled-up crediting program baselines.** Section 3 provides a brief overview of the **Article 6 mechanisms** under the Paris Agreement and discusses some key provisions in the Paris Agreement that have significant implications for crediting program baselines, including the principles of maintaining **environmental integrity** and avoiding **double counting.** Section 4 explores **options for developing scaled-up crediting program baselines** in ways that address these principles, and that manage risks for host countries related to "over-transferring" GHG reductions (i.e., transferring away reductions that would be needed to demonstrate the achievement of the host country's NDC). Section 4 also discusses considerations related to setting the **crediting period** for a scaled-up crediting program, and examines **practical methods and approaches for developing baselines.** Section 5 addresses the particular issue of how to **translate NDC targets into discrete emissions pathways,** which may be necessary for baseline development and to engage in international transfers of GHG reductions. Finally, Section 6 identifies issues and questions related to baselines under the Paris Agreement that require **further investigation** and analysis.

# 2 Scaled-Up Crediting

For this technical note, *crediting* refers to a process by which GHG emission reductions achieved voluntarily by one party are transferred to another party, which may then formally count these reductions toward the achievement of its own GHG mitigation targets.[6] Current examples of internationally recognized crediting programs include the Clean Development Mechanism (CDM) and joint implementation (JI) mechanisms under the Kyoto Protocol. Under these programs, individual projects (or collections of projects under a "program of activities") can generate legally recognized emission reduction credits (representing 1 $tCO_2e$ of GHG reductions), which countries may then use to demonstrate compliance with the Kyoto Protocol's GHG emission targets.

## 2.1 What is scaled-up crediting?

A *scaled-up* crediting program is one that credits GHG reductions achieved across a (large) number of GHG sources, or across whole sectors of a country's economy. Key features that distinguish scaled-up approaches from project-based or programmatic crediting include the following:

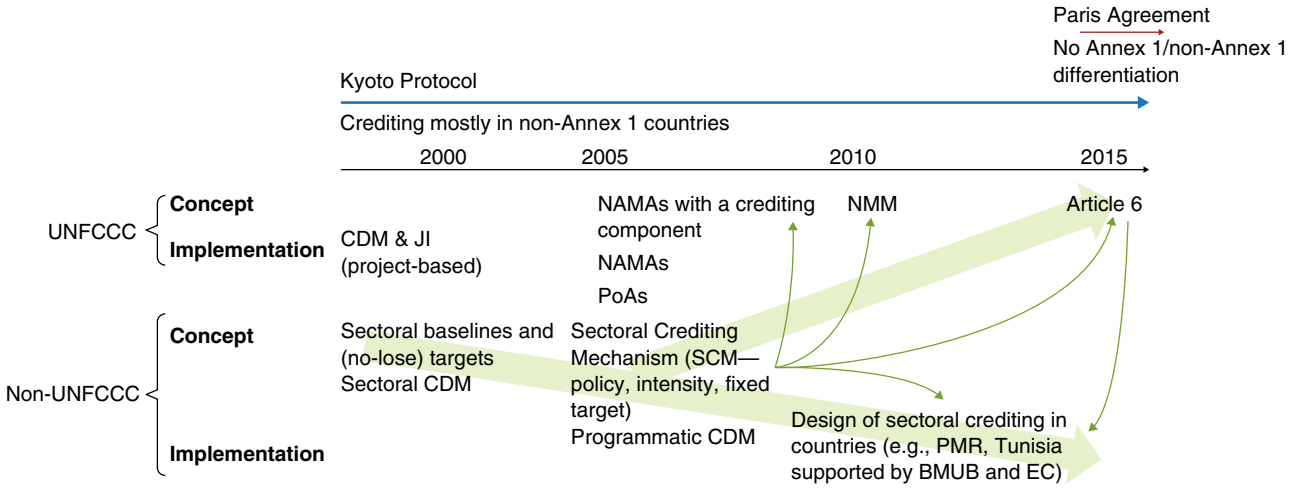
- Baseline emissions are established *collectively* for a predefined group of GHG sources (for example, all sources within a particular sector or subsector of the economy)
- Credits are issued or recognized based on *aggregate* reductions achieved across all included GHG sources
- Actions that reduce GHG emissions can be diverse and may be undertaken by *multiple entities* responding to incentives, rather than a single implementing entity
- Credits may be issued to *a single entity*, such as a government body, responsible for establishing and implementing policy incentives or requirements (including government enacted policies, for example) that drive emission reductions across all included GHG sources

Some authors distinguish between different models of scaled-up crediting, such as "sectoral" and "policy" crediting (e.g., Partnership for Market Readiness (2015a)). As a practical matter, scaled-up approaches may often require government coordination (including the establishment of policies or measures to achieve creditable reductions), and may require different methodological tools to quantify achieved emission reductions. However, the precise institutional and administrative arrangements, as well as the exact coverage of a scaled-up crediting program, are immaterial to the baseline concepts discussed in this technical note.

While the concept of scaled-up crediting has been around for several years, most crediting activities have been implemented at a project level (e.g., the CDM). Some degree of aggregation can be observed, e.g., with CDM programmes of activities. But currently there are no operational scaled-up crediting programs as

6 In the context of existing emissions trading schemes, the transfer is usually effected through the sale of tradable "credits," each representing (for example) one metric ton of $CO_2$-equivalent reductions. In principle, the formal transfer of GHG reductions could be done without the issuance of credits (e.g., through international treaty or contractual arrangements). In this technical note, however, we refer to all such transfers as "crediting" of emission reductions, and the programs that generate the reductions as "crediting programs."

**FIGURE 1. Evolution of the conceptual design and implementation of crediting mechanisms**




defined here (Figure 1). A number of PMR participants, however, are actively contemplating scaled-up crediting mechanisms (Table 1).

## 2.2 Scaled-up crediting program baselines

The baseline for a scaled-up crediting program determines the reference point against which (creditable) GHG reductions are quantified. In theory, a baseline should reflect emissions that would have occurred in the absence of a crediting program. These emissions could be influenced by a number of factors, including both existing and planned policies affecting sources covered by the crediting program (Partnership for Market Readiness, 2013).

The most likely emissions pathway in the absence of a crediting program — assuming the continuation of *current* policies — is often referred to colloquially as "business-as-usual" (BAU).[7] Most existing crediting programs (such as the CDM and JI) use some form of BAU baseline to determined creditable GHG reductions. In theory, however, it may be valid to ask whether *planned* policies, actions, or legal requirements should be incorporated in a baseline projection — especially if they are planned regardless of the implementation of the crediting program (Figure 2). This question is especially pertinent under the Paris Agreement, since nearly every country has now pledged future climate change mitigation actions in the form of "nationally determined contributions" (NDCs). The answer is not necessarily straightforward, however, and may depend on a country's plans for using crediting to achieve broader policy objectives, and how a country's NDC targets will translate into policies and actions affecting sources covered by a crediting program. The answer may also depend on rules that could ultimately be promulgated under the Paris Agreement.

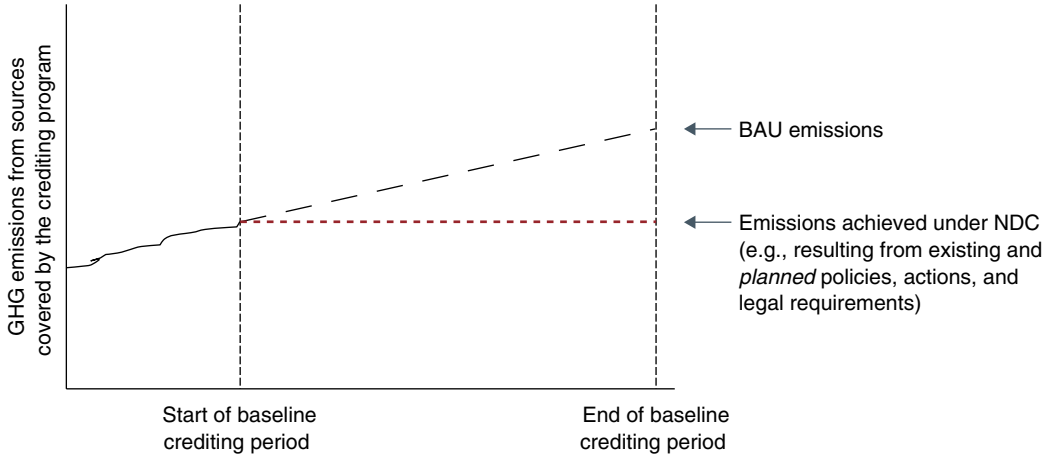
One potential challenge is that current NDCs are often not specified as a discrete pathway of annual GHG emissions for a particular set of sources. Instead, some interpretation may be required to translate NDC targets

7 In some contexts, including some cases under the CDM, even current policies may be ignored for the purposes of defining a "BAU" baseline. Going forward under the Paris Agreement, however, the most likely practice will be to consider current policies as a given for the purposes of determining BAU.

**TABLE 1. Contemplation of scaled-up crediting approaches and NDC-related activities requiring quantification of GHG impacts among PMR countries**

| Country | Type of instrument(s) | Sectors covered | Timing of design of proposed instrument |
|---|---|---|---|
| Colombia | **NAMAs with a crediting component**<br>Domestic offset scheme<br>Possible permit scheme for vehicle importers | Urban transport | Pre-Paris Agreement<br>Link to NDC under consideration |
| Costa Rica | Project-based crediting instruments for multiple sectors with some voluntary domestic demand. Structured as sectoral programs with sectoral baselines or benchmarks.<br>**NAMAs with a crediting component** | Priority: transport, energy | Pre-Paris Agreement<br>Link to NDC under consideration |
| Jordan | Long-term aim: **scaled-up crediting mechanism** | Renewable energy and energy efficiency in industrial and commercial buildings, street lighting, water sector (sector for the potential scaled-up crediting mechanism still open) | Link to NDC under consideration |
| Mexico | **NAMAs with a crediting component** | Urban communities, urban transport | Pre-Paris Agreement<br>Link to NDC under consideration |
| Morocco | **Sectoral crediting** | Electricity, cement, phosphates | Pre-Paris Agreement<br>Close NDC coordination |
| Peru | **NAMAs with a crediting component** | Cement, solid waste, and small-scale renewables | Pre-Paris Agreement<br>Link to NDC under consideration |
| Sri Lanka | **Scale-up the existing domestic scheme** (Domestic Carbon Crediting Scheme — SLCCS) **and generate offsets that can be traded internationally — focus sectors: power sector, and possibly buildings and transport at a later stage** | Priority: transport and energy<br>Optional: industrial and waste sectors, buildings | Post-Paris Agreement<br>Link to NDC under investigation |
| Thailand | Project-based crediting<br>Voluntary energy performance certificate scheme (no carbon credits) | Energy production, industry and large commercial buildings<br>Municipalities and communities<br>Cities | Pre-Paris Agreement<br>Link to NDC under consideration |
| Tunisia | **Sectoral crediting** | Electricity, cement (initial); reconsidering in light of NDC targets | Pre-Paris Agreement<br>Close NDC coordination |
| Vietnam | **NAMA with a crediting component** | High GHG emitting industries, solid waste | Pre-Paris Agreement<br>Link to NDC under consideration |

**FIGURE 2. What is the proper reference point for a baseline?**




into a baseline specific to the sources covered by a scaled-up crediting program — or into a threshold for restricting credit transfers (see Section 4.2). Options for doing so are further discussed in Section 5.

Finally, an important parameter for any baseline is the length of time over which it is considered valid for generating credits. This is often referred to as the *crediting period*. Determining an appropriate crediting period can involve a wide range of considerations (Partnership for Market Readiness, 2012; Partnership for Market Readiness, 2013). Under the Paris Agreement, a major consideration may be the timing and frequency with which NDCs are updated, and whether updating NDCs will affect GHG emissions at sources covered by scaled-up crediting programs. This is discussed in Section 4.3.

# 3 Scaled-Up Crediting under the Paris Agreement

Article 6.1 of the Paris Agreement recognizes that Parties can choose to voluntarily cooperate in the implementation of their NDCs "to allow for higher ambition in mitigation and adaptation actions" and "to promote sustainable development and environmental integrity." Although emissions trading and market mechanisms are not explicitly referred to in the text, a common understanding is that "voluntary cooperation" under Article 6 will permit various forms of international emissions trading as a means to achieve NDCs — including emissions crediting programs similar to the Kyoto Protocol's Clean Development Mechanism (CDM).[8]

Article 6.2 provides a basis for international recognition of voluntary cross-border cooperative approaches adopted by Parties. Specifically, it contemplates Parties using "internationally transferred mitigation outcomes" (or ITMOs) that may be counted toward NDCs. Per the text of the Article 6.2, these cooperative approaches should be voluntary, promote sustainable development, and ensure environmental integrity and transparency. They should also apply robust accounting to ensure, *inter alia*, the "avoidance of double counting."

Article 6.4 establishes a new, centrally coordinated international mechanism under the authority of the Conference of Parties serving as the meeting of the Parties to the Paris Agreement (CMA). This mechanism will be open to all countries (i.e., there is no distinction between Annex 1 and non-Annex 1 Parties as in the Kyoto Protocol). Per the text of Article 6.4, the mechanism will aim to promote mitigation of GHG emissions by both private and public entities, while "fostering sustainable development." Although Article 6.4 does not refer explicitly to ITMOs, it does contemplate allowing reductions achieved in a host Party to be "used by another Party to fulfill its [NDC]."[9]

Both Article 6.2 and 6.4 leave the door open to a variety of types and scales of cooperative approaches that could generate ITMOs (Article 6.2) or other transferrable emission reductions (Article 6.4). Such approaches could include crediting programs. Although current project-based crediting mechanisms like the CDM and Joint Implementation (JI) may transition into the Article 6 frameworks, other approaches, including scaled-up crediting programs, might be possible under either mechanism.

Specific guidance for developing baselines for use under the Article 6 mechanisms has yet to be developed (see Section 6). However, two general principles found in the Paris Agreement are relevant to crediting programs and could influence how prospective host countries approach baseline development for such programs (including scaled-up approaches). The first is the principle of *environmental integrity*. The second is the related principle that any transfers of mitigation outcomes must *avoid double counting*.

8 See, for example, Marcu (2016).

9 One open question is whether transfers under Article 6.4 will automatically be considered ITMOs under Article 6.2. This is the understanding of many, but not all, Parties. Also, Article 6.4 would not necessarily have to be used to effect transfers that could be used to fulfill another Party's NDC. It could in principle also be used as a domestic tool, e.g., for voluntary cancellation.

## 3.1 Environmental integrity

Article 6 of the Paris Agreement includes several provisions relating to "environmental integrity," although the term is not defined. It is still unclear how this principle will be defined and operationalized.[10] In the context of Article 6, a possible interpretation could be that the use of international transfers under Article 6 should not result in higher global emissions than if the NDCs had been achieved only through domestic action. Corollary to this, one credit from a crediting program may be said to have environmental integrity if it is associated with a mitigation outcome that equals or exceeds one $tCO_2e$ (Schneider et al., 2017).

For a scaled-up crediting program, achieving environmental integrity would require, *inter alia*, that its baseline be set no higher than the emissions level that would occur in the absence of the program (which could be BAU emissions, or emissions corresponding to NDC targets, as discussed above in Section 2.2 and elaborated further in Section 4). A higher baseline would result in more credits being issued than actual GHG reductions achieved, which in turn could cause higher global emissions than a scenario without any crediting (see Partnership for Market Readiness, 2012; Schneider et al., 2017).

A related principle arises specifically in the context of the new mechanism envisioned under Article 6.4. Article 6.4(d) stipulates that this mechanism should achieve an "overall mitigation in global emissions." One possible interpretation is that global GHG emissions should be *lower* when the mechanism is used, compared to a situation where Parties would achieve their NDCs without using the mechanism (in contrast to environmental integrity, which suggests only that emissions should *not be higher*). This may have implications for how scaled-up crediting program baselines are set. For example, it could mean that baselines should be set either *below* BAU (e.g., see Section 4.1.2) or *below* emissions corresponding to NDC targets (e.g., see Section 4.2.2). Alternatively, a lower global emissions outcome could be achieved by *withholding additional transfers*, e.g., by withholding more than is prescribed in Sections 4.2.1, 4.2.2, and 4.2.3. The "overall mitigation" principle may be important to consider for crediting programs that are developed to be consistent with Article 6.4.

## 3.2 Avoidance of double counting

Another requirement for environmental integrity is that transferred GHG reductions cannot be claimed by more than one party (including the transferring and receiving parties). Again, this is because such "double counting" could lead to higher global emissions than a scenario in which no transfers occur. More specifically, double counting would lead to situations where countries may all report having achieved their NDC targets, but where total global GHG reductions actually fall short of those targets because some reductions were counted twice. This possibility is explicitly recognized under the Paris Agreement as an outcome to be avoided.

Avoiding double counting is referred to in several passages throughout both the Paris Agreement and the Paris decision text (Table 2). Although the Agreement does not formally define double counting, the term generally refers to any situation where the same emission reduction is counted more than once for the purpose of meeting GHG mitigation targets. Thus, double counting would occur, for example, if more than one Party counts the same GHG reduction toward achievement of its NDC.

10 Article 6.2 requires Parties to 'ensure environmental integrity and transparency' when engaging in cooperative approaches. It is yet unclear whether the international guidance under Article 6.2 will include provisions that operationalize the principle of environmental integrity. The Article 6.4 mechanism includes a number of provisions that aim to safeguard environmental integrity that resemble closely those of the CDM: mitigation benefits should be additional, real, measurable, and long term, and emission reductions should be certified by designated operational entities. It thus appears likely that the rules, modalities, and procedures for the Article 6.4 mechanism will include specific provisions for environmental integrity.

**TABLE 2. Paris Agreement and decision text references to avoiding double counting**

| Paris agreement | |
|---|---|
| Article 4.13 | Requires Parties to ensure that double counting is avoided in GHG accounting related to their NDCs |
| Article 6.2 | Requires that Parties engaging in international transfers of mitigation outcomes to apply "robust accounting to ensure, *inter alia*, the avoidance of double counting" |
| Article 6.5 | Requires that emission reductions achieved under the mechanism established under Article 6.4 cannot be counted toward more than one Party's NDC |
| **COP 21 decision** | |
| Paragraph 36 | Requires that guidance related specifically to the implementation of Article 6.2 includes guidance "to ensure that double counting is avoided on the basis of a corresponding adjustment by both Parties for anthropogenic emissions by sources and/or removals by sinks covered by their [NDCs]" |
| Paragraph 93 | Specifies that modalities and procedures related to transparency (Article 13) shall "take into account . . . the need to ensure that double counting is avoided" |
| Paragraphs 107 and 108 | Specify that double counting should be avoided in the context of action prior to 2020 |

Formally, double counting of emission reductions can occur in three ways: double issuance, double claiming, and double use (Schneider et al., 2015). *Double issuance* occurs if more than one unit is issued for the same emission or emission reduction; this leads to double counting if multiple units, representing the same emissions or emission reductions, are used to meet a mitigation target. *Double claiming* occurs if the same emission reduction is counted twice toward attaining mitigation targets: once through a GHG inventory where the reduction occurs, and once again by an entity using an emission reduction unit issued for the reduction. *Double use* occurs when the same issued unit is used twice to achieve a mitigation target, either twice by the same entity or once each by two different entities.

Double issuance and double use can be addressed through the establishment of appropriate accounting boundaries when quantifying GHG reductions, and through robust registries and unit tracking systems. Avoidance of double claiming, on the other hand, requires robust procedures to account for transfers of GHG reductions (regardless of unit issuance). Because international rules on double claiming may affect the quantity of GHG reductions a country can legitimately transfer, it is the most relevant form of double counting for setting a crediting program baseline. In the context of a crediting program under the Paris Agreement, double claiming could occur if *all* of the following are true:

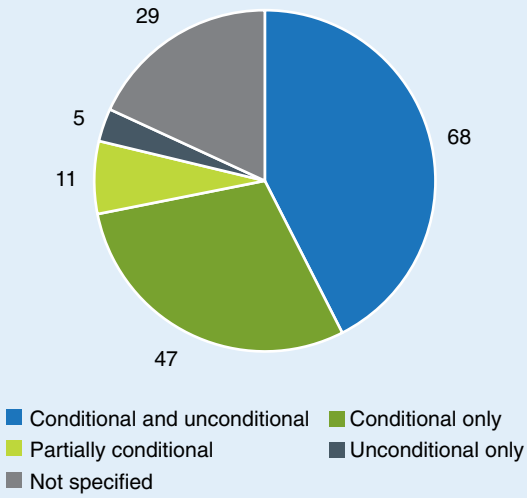
1. An emission reduction falls within the scope of a host country's NDC;
2. The emission reduction is reflected in the host country's GHG inventory (or other metrics used to measure progress toward achieving its NDC);
3. The same emission reduction is credited (e.g., as a "mitigation outcome") and transferred to another country;
4. The transfer of the emission reduction is not accounted for by the host country, i.e., the host country does not make any adjustment either to its reported GHG emissions or its NDC pledge; and
5. The country receiving the transferred emission reduction uses it to achieve its NDC, subtracting the transfer from its reported GHG emissions or adding it to its emissions budget.

One important open question related to double counting under the Paris Agreement is whether any formal distinctions will be made between "conditional" and "unconditional" NDC pledges (Box 1). As noted in Section 6,

## BOX 1. Double Counting and NDC "Conditionality"

Many countries have distinguished between commitments in their NDCs that are "conditional" and "unconditional." Conditional contributions are usually premised on the availability of some form of additional international financial support. Some countries have *only* submitted what they indicate are conditional pledges in their NDCs (Figure 3). In many cases, countries have not explicitly stated what kind of support they are seeking for their conditional pledges, or even precisely what sectors or measures would be subject to conditional action.

### FIGURE 3. Conditionality of NDC pledges




*Note:* Numbers shown are number of NDCs (out of 169).

*Source:* CAIT Climate Data Explorer (http://cait.wri.org/indc/#/).

One approach to baselines for scaled-up crediting discussed in this paper is to use the host country's NDC targets as a starting point for developing a baseline trajectory. One open question would be whether the conditionality of the NDC targets is relevant for setting the baseline, particularly when a country has both conditional and unconditional targets. The challenge is that, despite what Parties have indicated in their submissions, the Paris Agreement and associated decision text do not formally address or acknowledge distinctions between conditional and unconditional NDC elements. The Paris Agreement also does not say whether Parties' compliance with their commitments under the agreement will be considered only in relation to unconditional targets, or also in relation to conditional targets — although the latter could clearly be problematic if the necessary conditions were not met.

In terms of double counting, Article 6.5 states only that emission reductions achieved under the Article 6.4 mechanism "shall not be used to demonstrate achievement of the host Party's [NDC] if used by another Party to demonstrate achievement of its [NDC]." This does not specify, however, whether this provision applies to the achievement of conditional targets as well as unconditional targets. If a country is considering to use a crediting program to support its conditional NDC component, then if the Article 6.5 provision applies, the emission reductions could only be used by one country, so any transferred units could not be used by the host country to demonstrate achievement of its NDC target (conditional or unconditional). The unconditional target might still be met, of course, because it would require fewer emission reductions. In addition, there could be means to still use international crediting programs to support the host country in achieving its conditional NDC targets, for example, if only a part of the reductions is counted by the buyer country toward achieving its NDC, and the other part is used by the host country to achieve its conditional NDC targets.

This question is important for countries seeking to host a scaled-up crediting program because — as discussed in Section 4 — host countries will need to understand what level of mitigation they are obligated to achieve in order to avoid "over-transferring" mitigation outcomes. This in turn could have implications for how the country sets a baseline.

this question will need to be resolved through further negotiation, and could have significant implications for crediting program baselines.

Another critical question is the approach that might be used to avoid double counting. Paragraph 36 of the decision text calls for making "corresponding adjustments" to reported GHG emissions for countries engaged in a transfer (Table 2). Corresponding adjustments would likely be implemented as follows:

1. A host country would implement a scaled-up crediting program that achieves emission reductions that fall within the scope of its NDC;
2. The emission reductions would be reflected in the host country's GHG inventory (or other metrics used to measure progress toward achieving its NDC);[11]
3. The emission reductions would be credited and transferred to another country;
4. The host country would then apply a corresponding adjustment to its reported GHG emissions covered by its NDC by adding a quantity of emissions equal to the quantity of transferred reductions; and
5. The country receiving the transferred emission reductions would account them toward its NDC, by making a corresponding downward adjustment to its reported GHG emissions covered by the NDC.

Figure 4 illustrates the implementation of this approach. Although the details of how this approach would be implemented and overseen are still to be determined, it is relatively safe to assume that something like this basic procedure will be followed (Schneider et al., 2016).

Note that the relative quantity of transferred GHG reductions in this example is deliberately exaggerated in order to illustrate the mechanics of corresponding adjustments; in practice, transfers — even from scaled-up crediting programs — are likely to involve a much smaller percentage of both seller and buyer country emissions volumes.

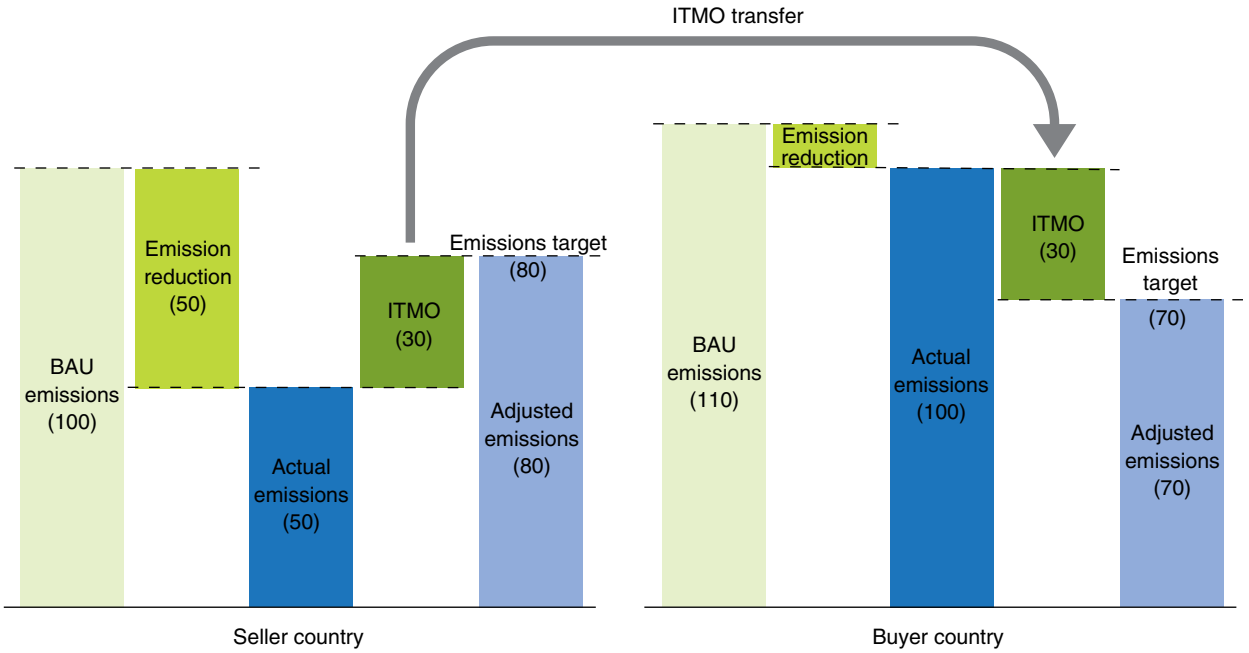
## 3.3 Implications of using "corresponding adjustments" to address double counting

The corresponding adjustment approach in principle ensures that no double claiming can occur when GHG reductions are transferred from one country to another. However, if adopted, this procedure will have at least two significant implications that are relevant to crediting program baseline development.

First, countries engaged in transferring mitigation outcomes will likely need a consistent framework for evaluating the effect of transfers on the achievement of their respective NDC targets, e.g., subtracting an outcome from the progress reported by the transferring country, and adding it to the progress of the recipient country. To date, such frameworks have been based on using a common metric for GHG emissions accounting (e.g., $tCO_2e$). Transferred mitigation outcomes might encompass more than just GHG reductions, but mitigation outcomes denominated in units other than quantities of emission reductions could present challenges for

11 In some circumstances, even if the crediting program affects GHG emissions covered by a country's NDC, the resulting GHG reductions may not be reflected in the country's GHG inventory (e.g., because national inventory methods lack sufficient resolution to capture the effects of the program). In this situation, no inventory adjustments may be strictly necessary to avoid double counting. However, adjustments could nevertheless be prescribed, in order to avoid disincentives for countries for incomplete or inaccurate reporting of GHG emissions; specific guidance for such situations will need to be developed and ultimately adopted by the CMA (i.e., the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement). For the purposes of developing a scaled-up crediting program today, it may be safest to assume that inventory adjustments will be required for all nominal transfers of GHG reductions, regardless of whether they are reflected in official inventory estimates.

**FIGURE 4. Avoidance of double claiming through corresponding adjustments**




*Source:* Schneider et al. (2016).

transparency and fungibility. For example, a MWh of renewable electricity generated in Brazil may displace a different amount of GHG emissions than an equivalent MWh generated in South Africa.[12] Likewise, as a practical matter to prevent double counting, an adjustment to reported GHG emissions must be reconciled with a country's NDC target. Thus, international rules may ultimately require that countries engaging in international cooperation under Article 6 express NDC targets in terms of explicit GHG emission outcomes in order to transparently account for the effect of transfers (Schneider et al., 2016). Baselines for scaled-up crediting programs may need to be expressed using the same metrics. We discuss general strategies for translating NDC targets into discrete baseline emissions pathways in Section 5.

Second, because of the need to make corresponding adjustments, hosting a crediting program can create potential risks for countries with ambitious NDC targets. Specifically, since a host country cannot count transferred GHG reductions toward achievement of its NDC target if the same reductions are also counted by the receiving country, it will need to carefully manage transfers to ensure that the achievement of its NDC target is not jeopardized. "Over-transferring" could occur if the country reduces GHG emissions, but then transfers a quantity of reductions such that the sum of its reported emissions and corresponding adjustments exceeds targeted levels. In Figure 4, for example, this would occur if the seller country transferred *more* than 30 units of mitigation outcomes. In this case, the seller country would need to compensate for the transfer by reducing emissions further, or purchasing international units.

Whether over-transferring is a concern also depends on whether the GHG sources addressed by a crediting program are covered by the NDC of the host country. If a crediting program addresses only sources *outside* the coverage of the host country's NDC, then no corresponding adjustments would be required, and transferring

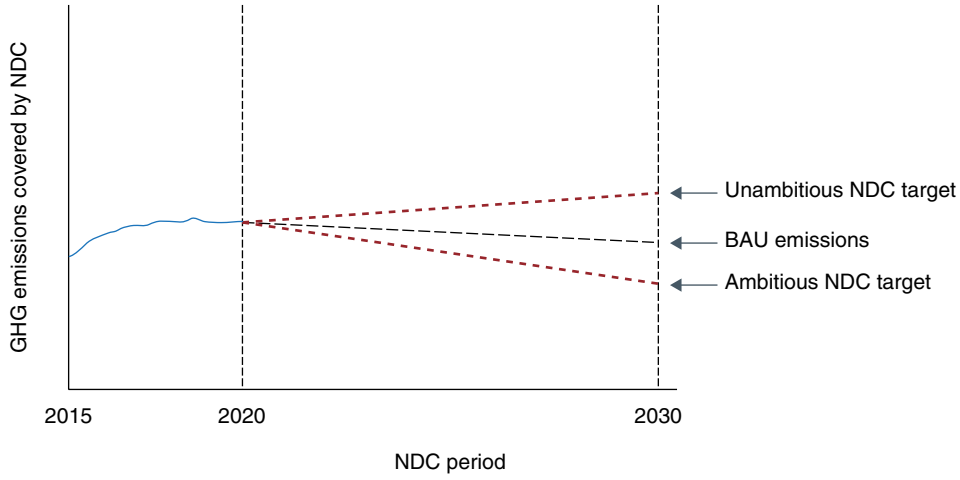
12 While the NDC pledges under the Paris Agreement are not necessarily denominated in $tCO_2e$, so far there are no examples or proposals to have tradable units in other "currencies" that would be used for compliance with NDC pledges. Nevertheless, clarity is needed on this issue in the negotiations.

GHG reductions generated from these sources will not compromise the country's ability to reach its current NDC target. However, steps may be required to ensure that any transferred reductions maintain environmental integrity (see Schneider et al., 2017).

Finally, the risk of over-transfer only arises where a country's NDC target is *ambitious*, which we define here as a target that is below BAU emissions (Figure 5). Countries with *unambitious* targets (i.e., those above BAU emissions levels) could transfer GHG reductions without compromising their ability to achieve their targets — even if the reductions were quantified using an inflated baseline or otherwise lacked environmental integrity. This is because, even if the country fails to *actually* reduce emissions below BAU levels, it will still *appear* to achieve its NDC target, as long as the sum of any corresponding adjustments plus its actual emissions does not exceed its target. One implication of this is that host countries with unambitious NDC targets may have only weak incentives to ensure the environmental integrity of credited GHG reductions. Countries with ambitious targets, on the other hand, must make efforts to ensure environmental integrity in order to avoid over-transferring. A similar dynamic arose under the Kyoto Protocol's Joint Implementation (JI) mechanism (Box 2). A parallel implication is that setting a scaled-up crediting program baseline linked to the country's unambitious NDC target — and/or allowing transfers such that the sum of a host country's actual emissions plus corresponding adjustments is equal to its NDC target — could actually undermine the environmental integrity of the crediting program.

Other analyses have explored these implications in more depth.[13] From an international perspective, a variety of approaches could be used to accommodate crediting in the context of unambitious NDC targets. We do not address these here. The options for managing over-transfer risk described in the next section presume that countries hosting scaled-up crediting programs will have ambitious NDCs. However, both host countries and countries receiving transfers may need to consider the environmental integrity risks associated with unambitious NDCs, and adjust baseline and transferring strategies accordingly.

**FIGURE 5. Conceptual illustration of "ambitious" vs. "unambitious" NDC targets**




13 See, for example, Schneider et al., 2017.

### BOX 2. Incentives for Environmental Integrity, and Managing Over-transfer Risk, under Joint Implementation Mechanism of the Kyoto Protocol

Under Joint Implementation (JI), countries with emission reduction commitments under the Kyoto Protocol could credit emission reductions from projects or programs of activities (PoAs) and issue emission reductions units (ERUs). ERUs could only be issued in conjunction with a corresponding cancelation of a host country's Assigned Amount Units (AAUs) — equivalent to making "corresponding adjustments" to avoid double counting. More than 95% of ERUs were issued by countries with significant surpluses of AAUs in the first commitment period of the Kyoto Protocol (i.e., unambitious targets, which were primarily set to allow for economic recovery in countries with economies in transition). The surpluses were large enough that those countries did not have any over-transfer risks, despite the fact the *ex post* assessment of the ERUs from these countries pointed to a lack of environmental integrity (Kollmuss et al., 2015).

On the other hand, other countries under the JI system did not have surplus AAUs and had to manage over-transfer risks accordingly. These countries pursued different approaches to manage the risk. Several countries set aside a "reserve" of AAUs, for example, for any projects that reduced emissions in sectors covered by the EU Emissions Trading System (ETS). This enabled crediting of JI projects that reduced emissions within the scope of the EU ETS, while ensuring that achievement of the mitigation goals of the EU ETS was not undermined. While JI included approved methodologies for setting baselines and calculating ERUs, several countries took additional steps to restrict transfers of ERUs. These countries required that credited mitigation actions not be "double-supported" (e.g., by feed-in tariffs as well as carbon markets) and that they go beyond applicable laws and regulations. Many EU countries, for example, required that the emissions baseline for crediting $N_2O$ abatement from nitric acid was set to a benchmark corresponding to EU regulations. In this way, only emission reductions beyond applicable regulations were credited. France adopted a discount rate of 10% across all types of JI projects to ensure that fewer credits were transferred than the actual emissions reductions that occurred in the country, thereby facilitating the achievement of its mitigation targets.

# 4 Developing Scaled-Up Crediting Program Baselines under the Paris Agreement

In this section, we present options for developing scaled-up crediting program baselines that can accommodate expected requirements for environmental integrity and avoidance of double counting under the Paris Agreement. We also discuss considerations around baseline crediting periods, and describe general methods and processes that could be used for baseline development.

At the highest level, options for baseline development depend on:

- Whether a crediting program covers sources within or outside the coverage of a host country's NDC; and
- Preferred methods for establishing a baseline and managing environmental integrity and over-transfer risk.

For each of the options, we discuss advantages and disadvantages, and explain the conditions under which a particular approach may make sense. Table 3 summarizes the options and key considerations associated with them. The choice of options may depend on a range of factors, including the current level of clarity and planning around NDC implementation and its implications for GHG emissions; credit buyer preferences and risk tolerance; and considerations about the needed structure and certainty for market participants.

Note that the discussion of these options is premised on some key assumptions, in particular:

- The host country has ambitious NDC targets, and will achieve them;
- NDC targets will be met for GHG sources not covered by a scaled-up crediting program; and
- Double counting is avoided through the use of corresponding adjustments.

## 4.1 Baseline options where the crediting program falls outside of NDC coverage

For a host country that does not yet have economy-wide emission targets, one option is to adopt a scaled-up crediting program only for groups of sources that fall outside the coverage of the country's NDC. Since emissions from these sources will not be counted toward the achievement of the country's NDC, crediting and transferring GHG reductions from them will not compromise the country's ability to reach its NDC targets. For example, if a crediting program covers only sources in the waste sector, but a country's NDC covers only the power and industrial sectors, then the crediting program would fall outside the NDC.

In these cases, the primary role of a baseline is to help ensure environmental integrity. An appropriate baseline can be developed by applying methods for determining BAU emissions (e.g., by projecting forward

**TABLE 3. Possible baseline approaches for scaled-up crediting programs, depending on coverage and approaches for managing over-transfer risk***

| Crediting program is established for sources . . . | Primary criterion for setting a baseline | Possible baseline approaches | Need to restrict transfers? | Key considerations |
|---|---|---|---|---|
| Outside the coverage of NDC targets | Ensure environmental integrity | BAU | No** | • Minimum condition for ensuring environmental integrity |
| | | Below BAU | No** | • Provides greater assurance of environmental integrity<br>• May help achieve "overall mitigation" (see Section 4) |
| Within the coverage of NDC targets | Manage over-transfer risk | BAU | Yes | • Avoids immediate need to translate NDC into discrete GHG emissions pathway<br>• Maximizes transferable reductions<br>• Requires careful management of transfers |
| | | Below BAU–above NDC | Yes | • Avoids immediate need to translate NDC into discrete GHG emissions pathway<br>• Maximizes transferable reductions<br>• May help reduce over-transfer risk |
| | | Below BAU–below NDC | No | • Avoids immediate need to translate NDC into discrete GHG emissions pathway<br>• Lowest over-transfer risk<br>• Reduces transferable reductions<br>• May help achieve "overall mitigation" (see Section 4) |
| | | Derive from NDC | No | • Low over-transfer risk<br>• Maximizes transferable reductions<br>• Requires translating NDC into discrete GHG emissions pathway |

* Assumptions: NDC targets are ambitious (below BAU); host countries intend to achieve their NDC targets; host countries meet or exceed their overall NDC targets, for GHG sources both within and outside the coverage of the crediting program; and double counting is avoided.
** However, crediting outside the coverage of NDC targets could complicate a country's plans to expand the coverage of its NDC in the future, in line with Article 4.4 of the Paris Agreement.

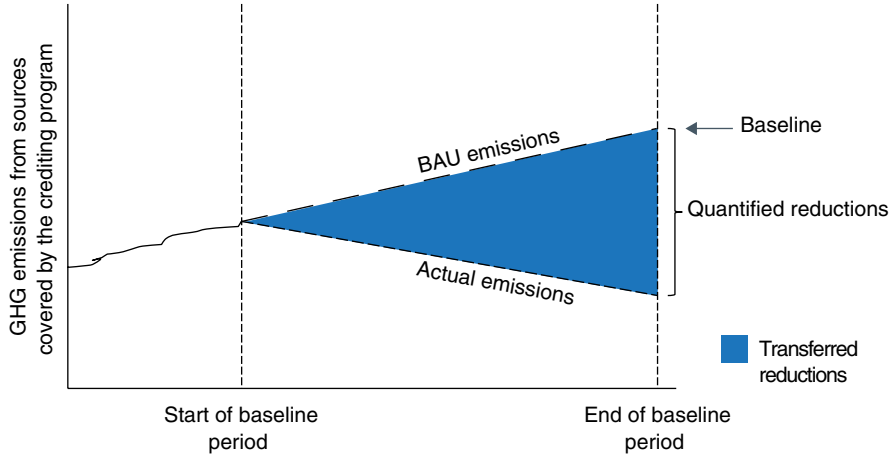
current policies and expected emissions trends), or below-BAU emissions (e.g., using benchmarking or other approaches) as is further discussed in Section 4.4.

If a host country adopts a crediting program outside the scope of its current NDC, it may wish to consider how this would intersect with any plans to expand the scope of its NDC in the future, in line with Article 4.4 of the Paris Agreement. This should be considered in establishing the crediting period for the baseline (see Section 4.3), but may also be a factor to consider when choosing a baseline approach. In particular, using a below-BAU baseline (see below) may provide greater flexibility to accommodate future NDC expansion. For various market participants, it may be necessary to clarify for how long crediting will be allowed before it is phased out, and what level of GHG reduction performance is needed for crediting versus what may be reserved for future NDC expansion.

### 4.1.1 Option 1: Develop a BAU baseline

A BAU baseline would result in crediting and (possible) transfer of all GHG reductions below BAU levels (Figure 6). This is the minimum required condition for ensuring environmental integrity (Partnership for Market Readiness, 2012; Partnership for Market Readiness, 2013), and would effectively maximize the quantity of creditable reductions for the host country. One challenge is that there may be a range of possible BAU emissions estimates for covered sources, and international procedural rules and methodologies for developing such baselines for scaled-up crediting programs have yet to be developed.

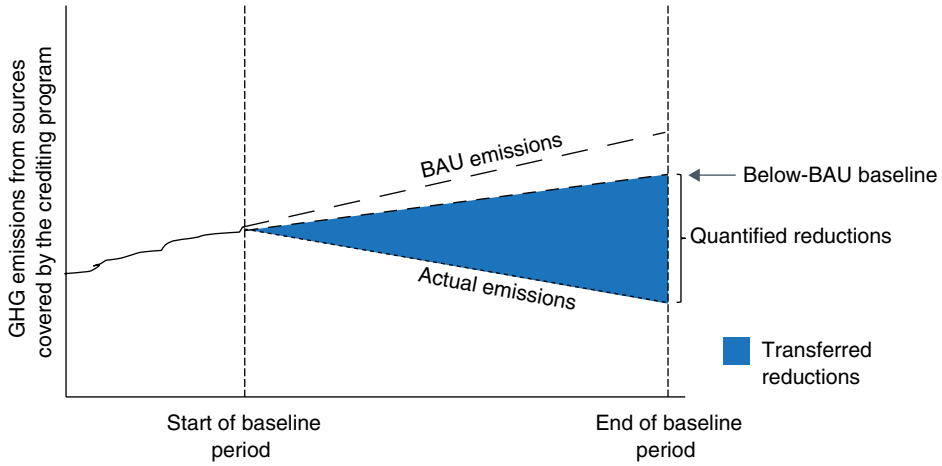
**FIGURE 6. Using a BAU baseline for a crediting program outside NDC coverage**




### 4.1.2 Option 2: Develop a below-BAU baseline

A below-BAU baseline would permit crediting of a lesser, more conservative quantity of GHG reductions (Figure 7). There are three potential advantages to adopting this type of baseline.

**FIGURE 7. Using a below-BAU baseline for a crediting program outside NDC coverage**



- First, methods for developing a below-BAU baseline can often be more straightforward and transparent than developing a BAU baseline. For example, a below-BAU baseline could be determined by establishing ambitious GHG emission benchmarks for sources covered by the program, without having to model BAU emissions trends in detail.
- Second, a below-BAU baseline may provide greater assurance of environmental integrity because it provides a conservative estimate of actual GHG reductions (relative to BAU).
- Third, it may facilitate future expansion of the host country's NDC to cover sources covered by the crediting program. This may enhance its acceptability under developing international rules for the Article 6 mechanisms.

### 4.1.3 Accounting for interactions with NDC-covered sources

One potentially significant challenge here is that there can be interactions between mitigation activities within and outside the sources covered by a country's NDC and a scaled-up crediting program. Mitigation measures designed to achieve GHG reductions required by the NDC, for example, can have spillover effects in sectors not covered by the NDC.

Conversely, mitigation activities designed to generate GHG reductions under a crediting program can have direct or indirect effects (including "leakage" effects) on emissions covered by an NDC. Countries that do not carefully account for these interactions may end up double counting GHG reductions (e.g., through allowing double claiming, or even double issuance).[14]

Setting baselines in ways that reflect overlap between the credited activities and sources covered by other policies can address this risk (Schneider et al., 2014). Some possible interactions, along with possible baseline solutions, are identified in Table 4. Alternatively, countries may choose to adopt scaled-up crediting programs only for groups of sources that are not subject to these kinds of possible interactions.

Moreover, under some NDC formulations it may be difficult to clearly determine precisely whether an emissions source is included in the NDC, e.g., because the NDC prescribes specific actions whose coverage and scope are ambiguous. One country, for example, included a number of specific technology targets for the power sector, such as the installation of mini and micro hydropower or institutional solar power systems. The NDC will thus reduce emissions in the power sector. Country's demand-side energy efficiency program, such as the installation of LEDs, would, however, also reduce emissions in the power sector and hence address the same emission sources as the actions in the NDC. At the same time, the entire power sector is not formally included within the scope of the NDC. In this context, further refinement and elaboration of the coverage of the NDC may be necessary to develop a defensible baseline for an energy efficiency crediting program (see next section), and could also help to more clearly attribute emission obligations and avoid certain kinds of double counting.

14 Crediting mechanisms often credit indirect emission reductions that occur upstream or downstream of the mitigation activity (please see Table 5 in Section 5). As a consequence, double issuance can occur in rather indirect ways, for instance, if two different crediting activities establish baseline emissions for the same indirect emission sources. Alternatively, if a crediting program credits indirect emission reductions that fall under the scope of the country's NDC, then double claiming could occur.

**TABLE 4. Possible interactions between crediting programs and NDC emissions, where the crediting program covers only GHG sources outside the scope of the NDC**

| Type of interaction | Example(s) | Solution | Possible baseline implications |
|---|---|---|---|
| NDC mitigation measures may ***reduce*** emissions covered by a crediting program | Policies to achieve renewable energy targets in the power sector (covered by an NDC) may incentivize development of landfill gas (LFG)-to-energy projects, which destroy methane emissions covered by a waste sector crediting program (outside NDC) | Ensure that the crediting program baseline reflects assumptions about LFG-to-energy project penetration due to renewable energy policies | Baseline may need to be modified from "business as usual" to reflect the indirect influence of policies designed to achieve NDC targets[15] |
| NDC mitigation measures may ***increase*** emissions covered by a crediting program | Policies to promote biofuel use in the transportation sector (covered by an NDC) may increase emissions in the land-use sector (outside NDC, but covered by a scaled-up crediting program) | Ensure that the land-use sector crediting program baseline reflects assumptions about the effect of biofuel incentives or mandates | Baseline may need to be modified from "business as usual" to reflect the indirect influence of policies designed to achieve NDC targets.[16] Alternatively, a BAU baseline could be adopted to ensure conservativeness |
| Activities that reduce emissions at sources covered by a crediting program may also ***reduce*** emissions (upstream or downstream from those activities) in sectors covered by an NDC | A waste sector crediting program incentivizes LFG-to-energy projects that reduce both $CH_4$ emissions (outside NDC) and $CO_2$ emissions in the electricity sector (within NDC) | Ensure that program only credits $CH_4$ reductions, not $CO_2$ reductions in the power sector | Baseline only covers $CH_4$ emissions |
| | A crediting program that substitutes biofuels for fossil fuels in transportation reduces emissions not only in the transport sector (outside of NDC), but also in the upstream fossil fuel supply chain, including oil extraction and refining (within NDC) | Ensure that program only credits displaced fuel emissions, not upstream emission reductions | Baseline only covers direct transportation fuel emissions |
| Activities that reduce emissions at sources covered by a crediting program may also ***increase*** emissions (upstream or downstream from those activities) in sectors covered by an NDC | A crediting program that substitutes biofuels for fossil fuels in transportation reduces emissions in the transport sector (outside of NDC), but increases emissions in other sectors, such as soil carbon emissions due to ploughing, emissions from the application and production of fertilizer, use of fossil fuels for cultivation of the biomass or electricity for irrigation, etc. (some or all of which are within NDC) | This type of interaction would need to be carefully considered in deciding whether to adopt the crediting program. Any pressure to increase emissions in sectors covered by the NDC would need to be counteracted by measures implemented to ensure the NDC target is met | No baseline impact (but these effects would need to be carefully weighed in deciding to undertake the crediting program) |
| | A crediting program that displaces fossil fuel fired boilers with efficient electric heat pumps reduces direct boiler emissions (outside of NDC), but increases electricity generation emissions (within NDC) | | |

15 Alternatively, the host country could argue that its NDC policies comprise a portion of incentives it is adopting to drive creditable reductions under the scaled-up crediting program. In this case, the baseline would not need to be adjusted from BAU. Currently, it is not clear whether this approach would be allowable under evolving international guidelines.

16 However, this could be perceived as creating a perverse incentive to adopt policies that increase emissions at sources covered by a crediting program. Such incentives have been the subject of extensive deliberation under the CDM, and rules were adopted to discourage them by disallowing crediting where baselines emissions have been inflated as the result of new policies. Similar restrictions could be applied under Article 6 mechanisms.

## 4.2 Baseline options where the crediting program is within NDC coverage

For crediting programs covering GHG sources that are also covered by the host country's NDC targets (which is the only option for countries with economy-wide targets), the primary concern is how to avoid over-transferring GHG reductions, given that corresponding adjustments will be applied to any transfers. The risk of over-transferring can be managed through a combination of baseline setting and withholding GHG reductions. Options include:

- Setting a **BAU baseline** and withdholding transfer of some GHG reductions;
- Setting a **below-BAU** baseline and managing transfers as necessary; and
- Setting a baseline **derived from NDC targets.**

### 4.2.1 Option 1: Setting a BAU baseline and restricting GHG transfers

Under this approach, the baseline would be defined as a continuation of current trends and policies (i.e., BAU) (Figure 8). This would allow all GHG reductions achieved at sources covered by the crediting program to be quantified and potentially credited. However, some of these reductions could be needed to demonstrate achievement of the host country's NDC targets.[17] Thus, the host country could decide to *transfer* only some of the reductions and would need to withhold the remainder, in order to ensure that its NDC targets are met.

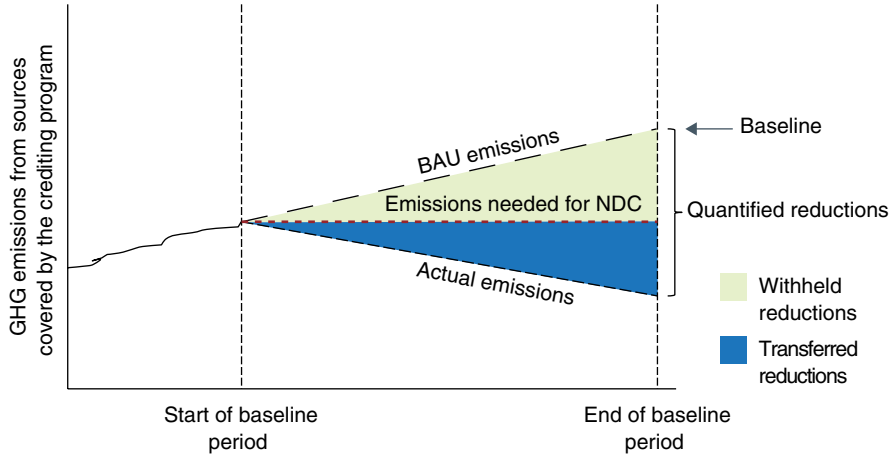
This approach could be implemented in a number of ways:

- One option would be to define a fixed *ex ante* percentage of reductions to withhold after each verification period. This would provide some certainty to potential credit buyers about how many credits could be made available for transfer.
- A second option would be to make an *ex post* determination of the quantity of credits to withhold based on a comparison of actual GHG emissions to NDC targets. This would give the host country more flexibility to ensure its NDC targets are met, at the expense of certainty for buyers.
- A combination of these approaches could also be used, e.g., fixed *ex ante* percentages for the initial years of a crediting program, followed by an *ex post* "true up" at the end of the program's crediting period.

One advantage of this approach is that it could allow the initiation of a crediting program before a country has translated its NDC targets into discrete GHG emissions pathways (see Section 5). Although such a translation may ultimately be necessary to reconcile transfers with NDC targets, some host countries may find it advantageous to begin crediting before undertaking the translation process and fully elaborating how their NDC will be achieved for sources both within and outside the coverage of the crediting program.

17 This would be the case unless the country overachieves against NDC targets at sources *not* covered by the crediting program.

**FIGURE 8. Example of using a BAU baseline and restricting GHG reduction transfers**



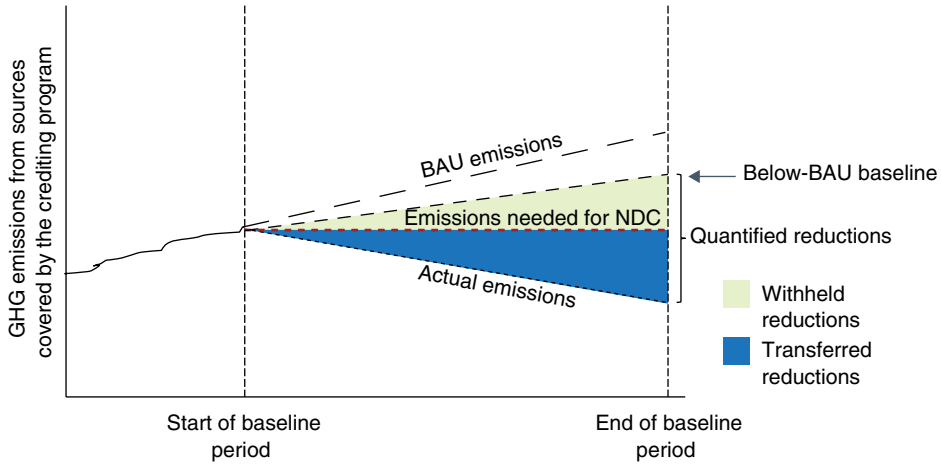

### 4.2.2 Option 2: Setting a below-BAU baseline and managing transfers as necessary

Under this option, the baseline could be defined using a variety of methods and assumptions, including by modeling the effects of new policies or by using an emissions benchmark for covered GHG sources (see Section 4.4). As with a BAU baseline, this approach could be applied independently of efforts to determine emissions levels needed to meet NDC targets. However, this could result in a baseline that is either above or below emissions levels ultimately derived from the host country's NDC, with differing implications for over-transfer risk.

If the baseline is set *above* an NDC-derived emissions pathway, then the host country may still need to withhold a portion of GHG reductions in order to help ensure its NDC targets are met. However, because fewer reductions would be quantified under this approach than under a BAU baseline, the quantity to withhold — and the associated risk of over-transfer — would be reduced (Figure 9).

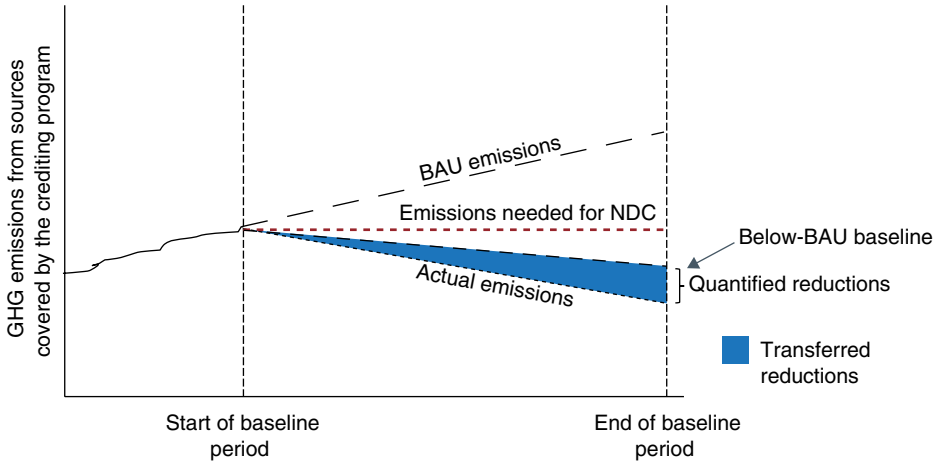
If the baseline is set *below* NDC-derived emissions, then all quantified GHG reductions could be transferred and over-transfer risk would be minimized. However, the host country would forego the opportunity to transfer

**FIGURE 9. Example of using an enhanced policy/benchmark baseline — above NDC emissions**



GHG reductions that are below NDC-derived emissions but above the baseline (Figure 10). This could reduce the amount of revenue generated by the crediting program. At the same time, the quantity not transferred could be used to insure against the risk of underachievement of NDC targets in other sectors.

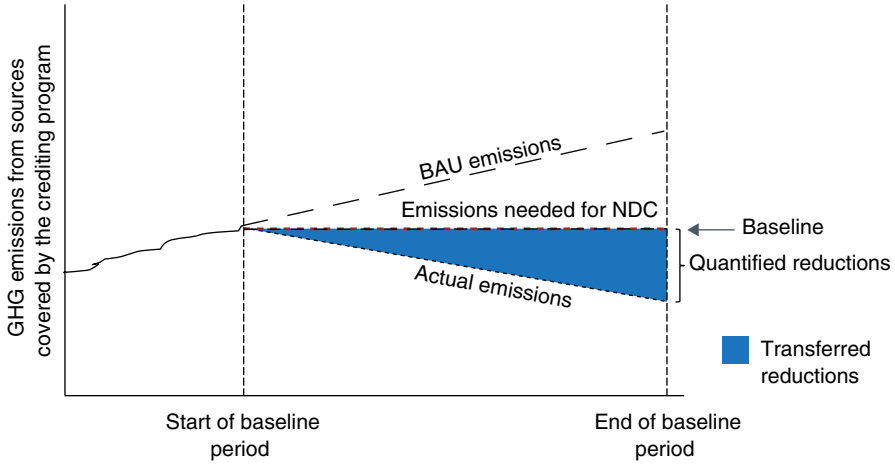
**FIGURE 10. Example of using an enhanced policy/benchmark baseline — below NDC emissions**




### 4.2.3 Option 3: Setting a baseline derived from NDC targets

This approach would ensure that only GHG reductions beyond those needed to achieve a country's NDC would be credited and made available for transfer (Figure 11). This would greatly reduce the risk of over-transferring GHG reductions, since it ensures that credits are only issued for GHG reductions below defined NDC targets for the sources covered by the crediting program. Over-transfer could still occur, however, if the country fails to achieve its NDC targets at sources *not* covered by the crediting program. This approach also maximizes the quantity of credited reductions that could be transferred without double counting.

**FIGURE 11. Example of using an NDC-derived baseline and restricting GHG reduction transfers**



The challenge with this approach is that it requires having clarity about how the country's NDC targets will affect GHG emissions at sources covered by the crediting program. This could be a challenge for many countries at the current time. Depending on how the NDC is currently formulated, translating NDC targets into a discrete emissions pathway for covered sources may require significant up-front effort (see Section 5). It may also require addressing current ambiguities over whether crediting can be used to achieve "conditional" NDC elements, and therefore whether the baseline should be linked to conditional or unconditional elements of a country's NDC (Box 1).

## 4.3 Scaled-up baseline crediting periods, and their relationship to NDCs

Because a country's NDC may help determine the baseline emissions for a scaled-up crediting program and will have implications for double counting and over-transfer risks, it may be important to clearly define a crediting period for the baseline (see Section 2.2) that aligns with plans for updating or expanding of the country's NDC coverage.[18] Doing so can signal to various market participants when revisions to the baseline may be necessary (for future crediting periods), or if and when the scaled-up crediting program may be phased out in favor of other policies. Several situations could arise from updates of NDCs. Specifically, a country could:

- increase the ambition of its current target;
- formulate a future target for a period that was not yet covered; or
- increase the scope of its current target.

If the ambition of the target is increased, the country may have to lower the baseline level in subsequent crediting periods to avoid „over-transferring" (i.e., if the increase in ambition should be achieved through action at sources covered by the crediting program). Similarly, if the coverage of the NDC is broadened, crediting programs targeting emission sources currently outside the scope of the NDC could be affected. For these reasons, the development of scaled-up crediting program baselines should be closely coordinated with development of a country's overall climate change mitigation strategy (as discussed in Section 4.4), and crediting periods should be defined accordingly.

## 4.4 From theory to practice: Methods and processes for baseline development

Regardless of which generic option is used for specifying a scaled-up crediting program baseline (i.e., BAU, below-BAU, or derived from the host country's NDC), an important question is what methods can be used to develop an actual baseline emissions pathway. Here we offer some preliminary guidance, keeping in mind that international rules, standards, and methodological requirements related to crediting program baselines under the Paris Agreement are still being agreed. Two dimensions are important to address: choosing an appropriate methodological approach, and integrating baseline development into national climate policy decision making.

18 Article 4.9 of the Paris Agreement requests the Parties to communicate an NDC every five years, and Article 4.3 highlights that each Party's successive NDC will represent a progression beyond the current NDC, i.e., ambition will need to be raised. Parties can at any time adjust their existing NDC with a view to enhancing their level of ambition (Article 4.11), including moving toward economy-wide emission reduction or limitation targets (Article 4.4).

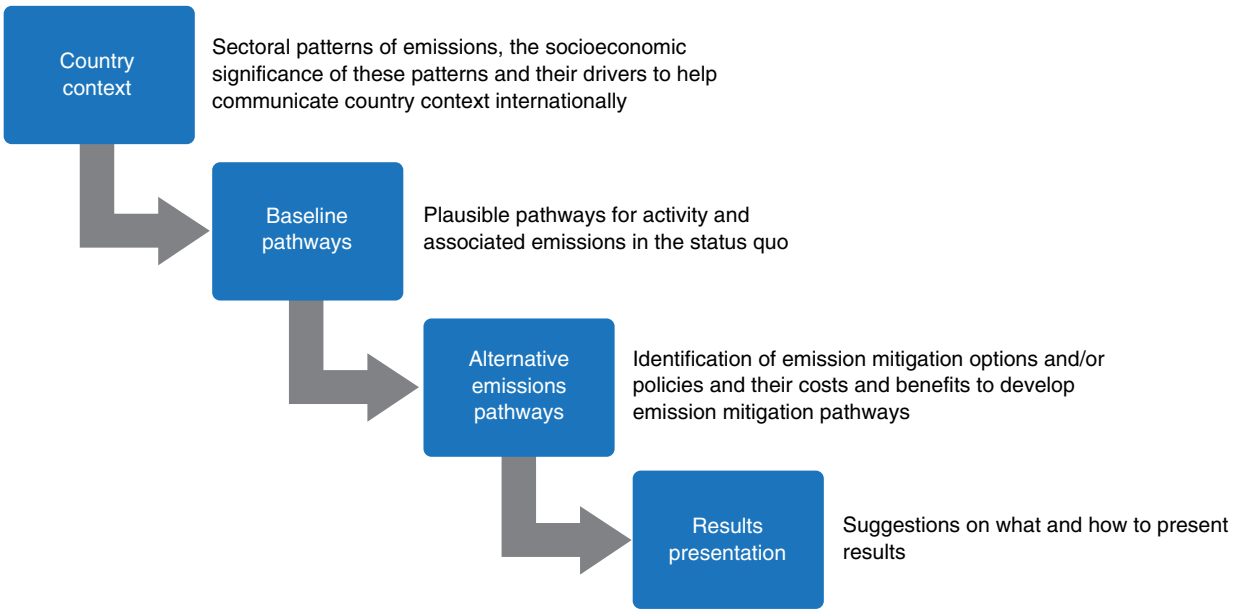
### 4.4.1 Choosing an appropriate methodological approach

Prior PMR technical notes have summarized various general approaches that can be used to develop a (BAU) emissions baseline (Partnership for Market Readiness, 2013). In short, developing a baseline "involves assigning values for baseline GHG [emissions] based on assumptions about future conditions that might hold in the absence of the [crediting program] and any other future policies and measures that might affect emissions" that, in theory, requires a "detailed understanding of the various drivers affecting GHG [emissions] under baseline conditions" (Partnership for Market Readiness, 2013, p. 60). In practice, a variety of methods may be used to forecast baseline emissions, ranging from simple projections (with varying degrees of sophistication) to simulation modeling.[19]

To maintain consistency and environmental integrity, it will often make sense to develop a scaled-up crediting program baseline using the same data, assumptions, and methods used to inform both the BAU and policy scenarios underlying a country's NDC target.[20] It may therefore be useful to draw upon the concepts and tools developed in recent years for creating national emission scenarios — the same tools that many countries will have used to formulate BAU scenarios and targets for their NDCs.

One framework for developing sectoral and national baselines is presented in the PMR's "Checklist on Establishing Post-2020 Emission Pathways" (Partnership for Market Readiness, 2015b). This guideline includes four major steps for establishing both baseline economic and emissions pathways and alternative pathways for mitigation. The Checklist also explains analytical approaches that are suitable for each component. Characterizing the historical drivers of sectoral and national emissions, for example, can involve using the Kaya

**FIGURE 12. Components of "Checklist on Establishing Post-2020 Emission Pathways"**

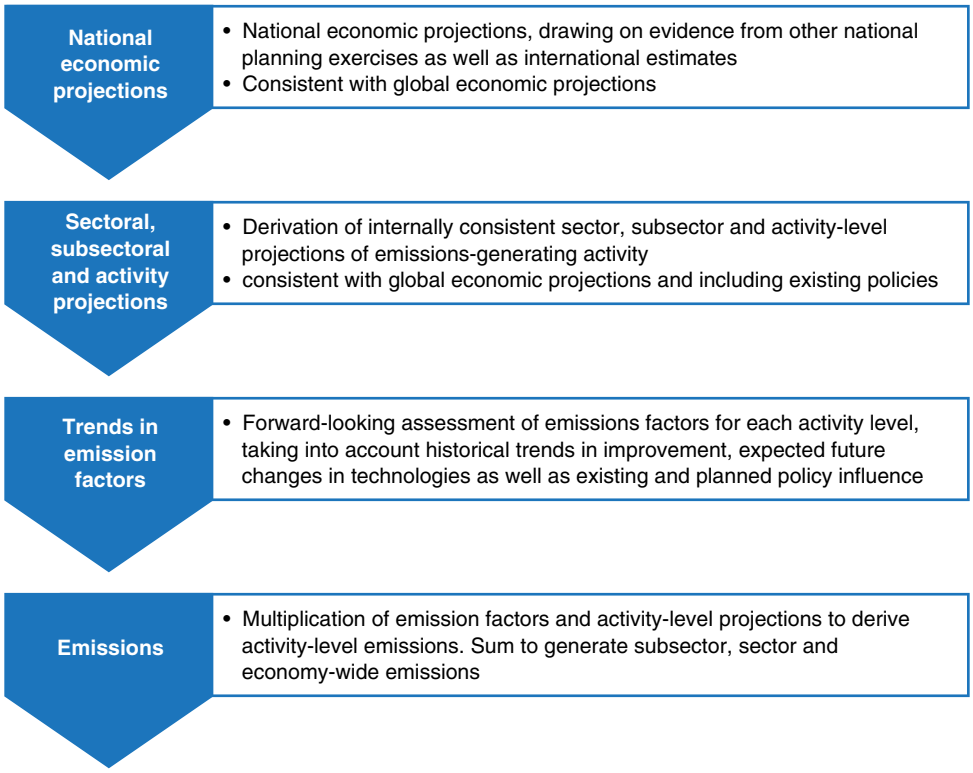



*Source:* Partnership for Market Readiness, 2015b, PMR Checklist (Figure 1).

19 A third category of approaches — using comparison groups (Partnership for Market Readiness, 2013) — is likely to be less relevant for scaled-up crediting programs.

20 Assuming the host country has an "ambitious" NDC, as described in Section 3.3.

**FIGURE 13. Four stage process to generate detailed bottom-up analysis of emission drivers and emissions**




*Source:* Partnership for Market Readiness, 2015b, PMR Checklist (Figure 3).

Identity (i.e., emissions = population × GDP/capita × energy use/GDP × emissions/unit of energy) or the ASIF decomposition (e.g., Activity, Structure, Intensity, Fuel). Importantly, the baseline pathways described in the Checklist should include the impact of existing and committed or planned policies, so the baseline is not a "no policy" scenario, nor is it the status quo or historical situation.

For projecting baseline pathways, the Checklist outlines different approaches including:

- Trend extrapolation: simple extrapolation of recent trends in economic growth and emissions intensity;
- Augmented extrapolation: adjusting historical trends to take into consideration expected changes in GDP growth rates or changes in emissions intensity;
- Decomposition projection: using external projections for the drivers of total emissions (e.g., from Kaya identity or ASIF decomposition) to estimate total change in emissions; and
- Detailed bottom-up analysis: sectoral or subsectoral analysis based on national economic projections, sectoral activity projections, or trends in sectoral emission factors.

Only the latter two approaches are likely to be detailed enough for scaled-up crediting programs. For each of the approaches and steps described above, there is a wide variety of tools, from energy sector optimization and engineering models to detailed land-use change and carbon sequestration models.

**BOX 3. Morocco: Assessing the Potential Contribution of the Building Sector to the NDC**

In its NDC, Morocco committed to reduce its emissions by 42% below BAU emissions by 2030 (conditional) and 17% below BAU emissions by 2030 (unconditional).[21]

The Secretariat for Sustainable Development, the Ministry of Housing and Urban Policy, and the Ministry of Energy of Morocco, with the support of the World Bank, developed a bottom-up agent-based economic model of the buildings sector in Morocco to assess the capacity of the building sector to contribute to the NDC commitments in terms of energy efficiency (i.e., how much mitigation can be achieved, at what cost, and which additional policy reforms might be required to help align investors' and consumers' behaviour with the NDC energy efficiency targets).

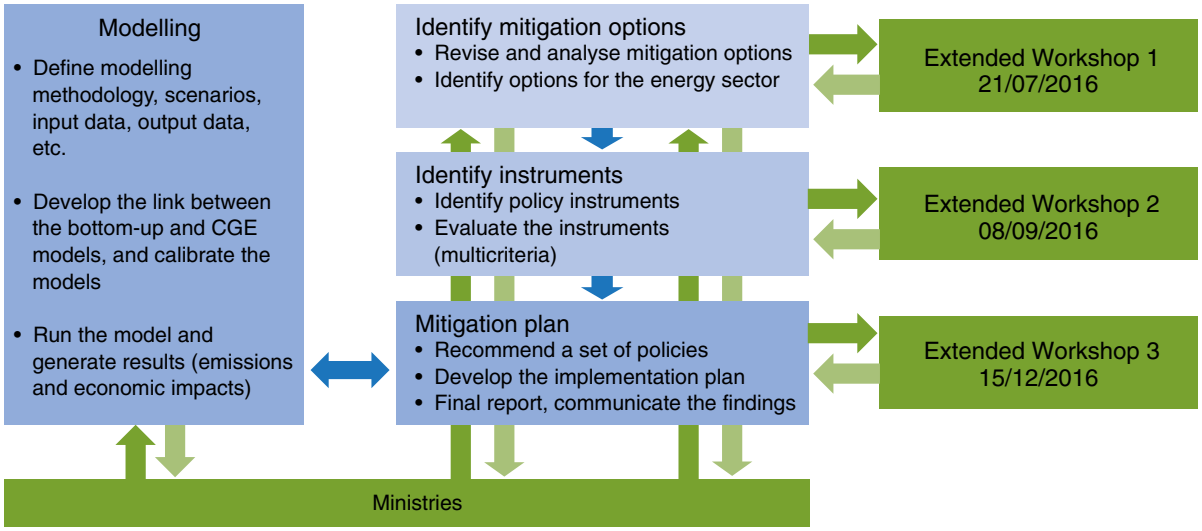
The modelling exercise is moving away from the macro economy-wide perspective to look at the investor perspective. The team uses inputs data on the building stock (e.g., number of buildings of different types, energy efficiency levels, heating and cooling systems, distribution over climate zones, turnover of building stock, etc.) and investors' decision-making criteria (e.g., actual transaction costs, expected rates of return for investors, value of comfort, etc.). The investors include households/home owners, tenants, building managers and developers. The model makes different assumptions on how the investor decision is made based on the user's criteria and entrenched behaviour, as well as in response to the incentives embedded in the current market, policy and regulatory environment. The tool helps explore the impact of various policy and interventions, beyond current policies and regulation, on the willingness of the investors to make energy efficient choices. Such policy and interventions include, for example, carbon pricing, market facilitation, technical assistance, access to finance, and industrial policies. The tool provides quantitative data on expected performance of policy options in terms of achieved energy saving, GHG emission reductions, cumulative cost of subsidies and other policy costs, and Net Present Value generated for the investors. The modelling exercise and the development of policy recommendations, implemented in close consultation between relevant ministries and agencies, facilitates the coordination and dialogue between the line ministries in charge of the sectoral policies and NDC implementation.

### 4.4.2 Integrating baseline development in national decision making

Because of requirements to avoid double counting under the Paris Agreement, transferring away GHG reductions under a scaled-up crediting program creates an opportunity cost for the host country: transferred reductions can no longer be applied toward achieving its own NDC targets. This suggests that a prospective host country should carefully consider how a scaled-up crediting program will fit within its overall national climate change mitigation plans. At a minimum, it will be important to embed institutional responsibility for crediting program development in the same agencies responsible for the definition, structure of a country's overall mitigation targets, monitoring systems, and implementation policies. Allocating the responsibilities for the overview and approval of scaled-up crediting programs to the same agencies that are responsible for coordination of the NDC implementation and reporting can help to ensure adoption of an appropriate baseline approach consistent with the selected strategy for managing over-transfer risk. Coordinated approaches are needed to ensure that common data and assumptions are used to inform both the NDC development (and associated GHG emissions pathways) and development of baselines at different levels, including for the crediting programs.

21 Government of Morocco, Morocco first NDC, http://www4.unfccc.int/ndcregistry/PublishedDocuments/Morocco%20First/Morocco%20First%20NDC-English.pdf

**FIGURE 14. Process for the development of the Greenhouse Gas Mitigation Plan for the Energy Sector of Chile**




*Source:* Government of Chile, draft Greenhouse Gas Mitigation Plan for the Energy Sector, March 2017.

The implementation of NDCs and related climate and sectoral policies can be facilitated by undergoing a systematic (climate) policy planning process that includes all relevant ministries and governmental agencies as well as stakeholders. Such a process can result in a plan for the implementation of the NDC that details for each sector its current and projected BAU emissions, and that identifies for each sector the policies and measures needed to achieve the NDC with the highest economic, environmental, and social co-benefits and the lowest cost for the public and private sector. Policy planning processes should involve coordination between ministries (e.g., Finance, Economy, Environment, Industry, Transport, Agriculture, etc.) and among different affected sectors. In Chile, for example, the preparation of the Greenhouse Gas Mitigation Plan for the Energy Sector (Box 4) was coordinated by the Ministries of Environment and Energy. It involved several interviews and workshops with various public and private sector stakeholders (Figure 14). Stakeholders included various ministries, such as the Ministry of Energy, the Ministries of Housing and Urban Planning, Transport and Telecommunications, and Mining, and representatives of the private sector such as the Mining Council, the Power Generators Association and representatives of NGOs, such as AVINA.

Besides improving the coherence and coordination between national and sectoral policies, such policy planning processes, including quantitative modelling, provide an excellent basis for clarifying and quantifying a country's NDC target, setting domestic (sub-) sector targets. This process also helps to eventually formulate an approach to deciding on where, and under which conditions, to allow for international crediting and how to set baselines that are consistent with meeting NDC targets and managing over-transfer risk.

### BOX 4. Chile: Modelling the Energy Sector Contribution to the NDC

In its NDC, Chile committed to reduce its $CO_2$ emissions per unit of GDP by 30% below their 2007 levels by 2030, and subject to international support, by 35 to 45%.[22] Chile used modelling to translate this national target to targets for the energy sector. The proposed sectoral targets are presented in the Greenhouse Gas Mitigation Plan for the Energy Sector developed by the Ministries of Environment and Energy. The draft was open for public consultation in March–April 2017.[23] The Plan estimates that between 17 $MtCO_2$ (National Energy Policy scenario) and 24 $MtCO_2$ (more stringent scenario) could be reduced in 2030 compared to the current policy scenario.

These results were obtained through the use of a model complemented by stakeholder consultations. The model is a hybrid model that combines a computable general equilibrium (CGE) economic model and a bottom-up model of the energy sector. The bottom-up model is structured around 4 sectors: power, transport, industry and mining, and buildings (households, public, and commercial).

The Chilean government is currently looking at using this model for other sectors. They are also exploring how to use the model to assess the impact of policies, such as various types of carbon pricing instruments on the economy and on emissions.

22 Government of Chile, Chile First NDC, 2015, published on UNFCCC NDC Registry in February 2017, http://www4.unfccc.int/ndcregistry/PublishedDocuments/Chile%20First/INDC%20Chile%20english%20version.pdf

23 Chile Ministry of Energy, Plan de Mitigación de Gases de Efecto Invernadero para el Sector Energía, http://www.energia.gob.cl/participa/consultas-ciudadanas/consulta-publica-3

# 5 Translating NDC Targets into GHG Emission Pathways

Regardless of whether a host country adopts an NDC-derived baseline or some other baseline for its scaled-up crediting program, international rules under the Paris Agreement may ultimately require that Parties elaborate NDCs — which are currently formulated in different terms (Box 5) — into GHG emission targets in order to participate in the international transfers under Article 6. This section addresses how countries might approach such a task.

### BOX 5. Different NDC Formulations

Parties to the Paris Agreement have adopted a variety of different kinds of pledges in their NDCs. Many NDCs specify explicit GHG reductions targets, but some indicate general actions to be undertaken, or targets specified in non-GHG terms (e.g., technology penetration goals; see Figure 15 and Figure 16). Broadly, they can be classified as follows:

1. *GHG targets.* These are pledges framed as explicit GHG targets, usually for a single year. Pledges may specify a specific numerical target, or a range or "corridor" for the emissions they will achieve. Different parties have specified targets in different ways, e.g.:
   a. *Absolute targets.* A pledge to achieve an absolute level of GHG emissions. These targets can be specified as either:
      i. *Reductions from a base year level of emissions.* For example, reducing emissions 20% below 2015 levels by 2030.
      ii. *Achievement of a fixed level of emissions.* For example, reducing emissions to 400 $MtCO_2e$ per year by 2030.
      iii. *Achievement of an emissions trajectory or range.* For example, South Africa has pledged to achieve a "peak, plateau, and decline" emissions range that would keep GHG emissions between 398 and 614 $MtCO_2e$ between 2025 and 2030.
   b. *Relative targets.* A pledge to achieve GHG reductions relative to some (variable) reference point. Different formulations include:[24]
      i. *Reductions relative to a "business-as-usual" scenario.* For example, reducing GHG emissions 40% relative to what they otherwise would have been (in the absence of mitigation efforts) in 2030.
      ii. *Reductions in GHG intensity.* For example, reducing GHG emissions per unit of GDP by 20% relative to the current emission rate.

*(continued)*



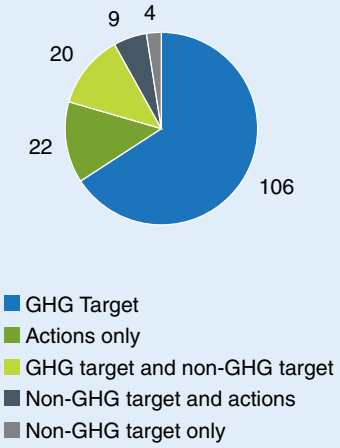
[24] A combination of these options is possible, e.g., a 20% reduction in GHG intensity relative to BAU intensity levels.

**BOX 5. Continued**

2. *Non-GHG targets.* These are pledges framed in terms of technology goals or types of mitigation actions, with or without numerical targets attached:
   a. *Non-GHG quantitative targets.* For example, pledging to generate 40% of all electricity from renewables by 2030.
   b. *Action-based targets.* For example, the Gambia has pledged "use of renewable energy sources in lighting, communication and health facilities, and for lifting water from wells and boreholes; and the Department of Forestry and local communities will continue to plant and care for trees annually."

Some countries have pledged a mix of both GHG and non-GHG targets.

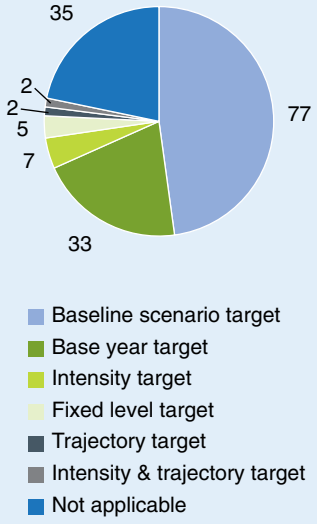
**FIGURE 15. Type of contributions in INDCs**




*Note:* Numbers shown are number of INDCs (out of 169).

*Source:* CAIT Climate Data Explorer (http://cait.wri.org/indc/#/).

**FIGURE 16. Type of GHG pledges**




*Note:* Numbers shown are number of INDCs (out of 169).

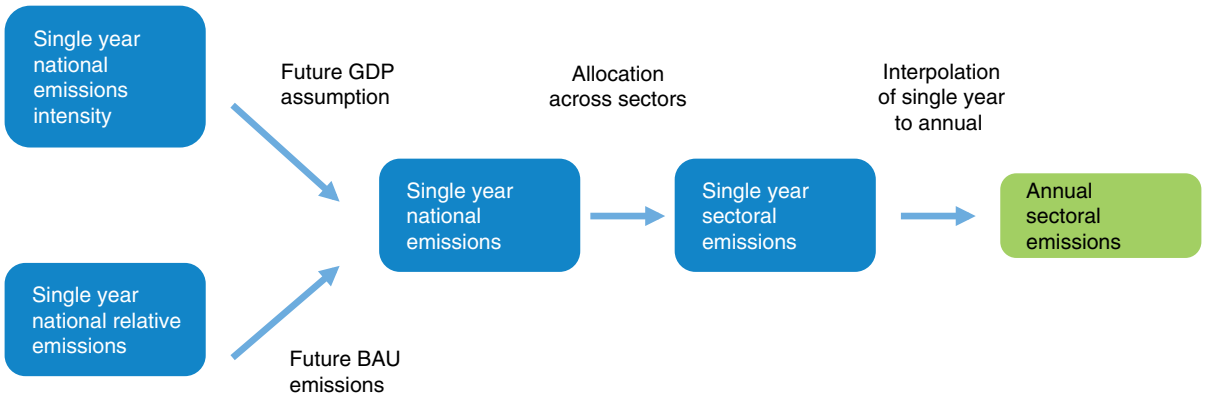
*Source:* CAIT Climate Data Explorer (http://cait.wri.org/indc/#/).

As described in Box 5, a key challenge is that countries have adopted a wide variety of mitigation pledges in their NDCs, with many different kinds of targets and formulations. Establishing baselines and participating in international crediting may require countries to move from these different kinds of NDC formulations to the definition of a GHG emissions pathway expressed in annual tons of $CO_2e$ — and specific to the sector covered by the scaled-up crediting program — as illustrated in Figure 17.

Key considerations for defining a GHG emissions pathway can include:

- Whether the NDC sets a national (or multi-sector) target, or it identifies a specific target for the sector (or group of sources) covered by the crediting program;
- Whether the target is specified for a single year, or over multiple years;
- Whether the target is specified in terms of GHG emissions, or in another form (e.g., an action-based target or a quantitative non-GHG target);

**FIGURE 17. Moving from various NDC target types to an annual sectoral emissions pathway needed for NDC compliance**




- For a GHG target, whether it is expressed in absolute terms, GHG intensity terms, or relative to BAU; and
- For NDC targets specified relative to BAU, whether BAU emissions are well defined and quantified, or undefined (or have an unclear analytical basis).

In many cases, countries have yet to elaborate specific policies and measures that will be used to implement their NDCs. This means that it may be difficult to say how a country's NDC implementation strategy might influence the GHG emissions from groups of sources covered by a scaled-up crediting program, and therefore what quantity of GHG reductions from covered sources is needed to ensure NDC compliance (i.e., the middle, red dotted lines in Figure 8 through Figure 11).

Table 5 briefly summarizes possible approaches to move from various types of NDC pledges to an annual, absolute, sectoral GHG emissions level that can be used to determine the level of GHG reductions needed for NDC compliance at sources covered by a scaled-up crediting program. For each type of NDC target, the table presents the principles needed for this translation of the target to an emissions pathway, and the additional assumptions and information that would be required for this translation.

Often, a modelling or other suitable process can be used to disaggregate, in a top-down fashion, an NDC target from the national level to a sectoral or subnational level. This can be done, for example, using general equilibrium models or partial economic models with an adequate representation of the relevant subsectors (PMR Secretariat, 2016; Fuessler et al., 2016). The final disaggregation and burden sharing between groups of emitters, however, is also a political decision.

Alternatively, the NDC itself may have been formulated using bottom-up analyses, building on BAU projections and mitigation potential estimates in different (sub-)sectors — and, in some cases, analysis of how the government intends to meet its NDC target and how the burden to reduce emissions is to be shared between the sectors. These bottom-up assessments, if they exist, can be used to determine the GHG reductions needed for NDC compliance at sources covered by a scaled-up crediting program.

**TABLE 5. Principles for translating an NDC target into discrete GHG emissions pathways for sources and sectors covered by the NDC**

| Type of NDC Target | | Principles | Additional Assumptions Required |
|---|---|---|---|
| **GHG target for sector*** | Absolute | Convert single-year NDC sectoral target to annual sectoral baseline | Interpolation method for other years (e.g., linear, accelerating) |
| | Relative to quantified BAU | Convert relative to absolute target →<br>Convert single-year NDC sectoral target to annual sectoral baseline† | Must have quantified BAU<br>Interpolation method for other years (e.g., linear, accelerating) |
| | Relative to an unquantified/poorly quantified BAU? | Revise or clarify NDC and quantify BAU →<br>Follow steps for GHG target for sector **relative to quantified BAU** | |
| | Emissions intensity | Convert emission intensity into absolute GHG emissions (However, this can be done using *ex post* activity data related to the intensity target) →<br>Convert single-year NDC sectoral intensity target to annual baseline† | Must have quantified BAU intensity<br>Interpolation method for other years (e.g., linear, accelerating) |
| **National (or multi-sector*) GHG target** | Absolute | Allocate national target to crediting sector →<br>Follow steps for **"GHG target for sector"** | Allocation method (e.g., GDP, value added, historical emissions share, etc.) |
| | Relative to quantified BAU | Convert relative to absolute (national) target →<br>Allocate national target to crediting sector →<br>Convert single-year sectoral target to annual sectoral baseline† | Must have quantified (national) BAU<br>Allocation method (e.g., GDP, value added, historical emissions share, etc.), or elaboration of specific sectoral policies and targets<br>Interpolation method for other years (e.g., linear, accelerating) |
| | Relative to an unquantified/poorly quantified BAU? | Revise NDC and quantify BAU →<br>Follow steps for **National (or multi-sector) GHG target relative to quantified BAU** | |
| | Emissions intensity | Convert (national) emission intensity into absolute GHG emissions →<br>Allocate national target to crediting sector →<br>Convert single-year sectoral target to annual sectoral baseline† | Need GDP (or other activity data) projections<br>Must have quantified BAU intensity<br>Allocation method (e.g., GDP, value added, historical emissions share, etc.), or elaboration of specific sectoral policies and targets<br>Interpolation method for other years (e.g., linear, accelerating) |
| **Non-GHG target** | Action-based | Revise NDC to include quantitative GHG target | |
| | Quantitative | Convert non-GHG NDC target (see Box 5 for examples) into GHG target →<br>Convert single-year sectoral GHG target to annual sectoral baseline† | Default/standardized emission factors for relevant sectors?<br>National expansion plants for relevant sectors?<br>Interpolation method for other years (e.g., linear, accelerating) |

* Here the word "sector" refers to any group of sources that might be covered by a scaled-up crediting program.
† See, for example, Lazarus et al. (2014).

# 6 Outstanding Issues and Questions

This technical note has laid out some general options and issues to consider in establishing baselines for scaled-up crediting programs, taking into account some key principles for international cooperation established in the Paris Agreement. However, detailed rules, requirements, and expectations — both from the standpoint of international negotiations and prospective buyer countries — are still evolving. Several outstanding questions related to scaled-up baselines will need to be further explored as countries proceed with the development of crediting programs (scaled-up, or otherwise) under the Paris Agreement.

## 6.1 How to treat conditional pledges

As noted in Box 1 (Section 3.2), many countries have identified "conditional" targets for their NDCs which they have agreed to undertake with international assistance, possibly including acquisition of the GHG reductions achieved under these conditional targets. As discussed, it should be further investigated how countries can be best supported toward achieving their NDCs in the light of the need to avoid double counting between host countries and acquiring countries for crediting programs that are covering sectors and sources included under the NDC scope or have direct or indirect impact on NDC sources. Options could include that acquiring countries only account for part of the achieved emission reductions toward their NDCs, allowing the host country to use another part. This presents a challenge for prospective host countries seeking to develop an appropriate baseline for sources covered by conditional NDC targets, before this issue is clarified.

## 6.2 Blended finance issues

The types of programs that will be supported by scaled-up crediting will require a wide variety of financing sources, including carbon finance, results-based climate finance (i.e., disbursements of climate finance against climate mitigation results not used for NDC compliance purposes by the finance provider — see World Bank Group, 2017), other forms of climate finance, and other development financing. Leveraging private finance for mitigation is a key goal of scaled-up crediting, and creating a stable and predictable carbon market under the Paris Agreement is an important step toward securing greater private sector participation. A question that has not been fully explored, however, is whether and how various forms of carbon and climate finance might affect the type of mitigation outcomes that could be transferred internationally and used for compliance with NDC targets. Similarly, this discussion may impact the baseline setting for scaled-up crediting.

## 6.3 Future baseline methodological requirements

Specific guidance for developing baselines for use under the Article 6 mechanisms has yet to be developed. This means there is still uncertainty about whether particular methods and approaches for developing baselines — especially for scaled-up crediting programs — will ultimately meet the expectations and conditions of (most) credit-buying countries and, overall, the international stakeholders involved in the governance and operationalization of the Article 6 of the Paris Agreement, as applicable. Given the apparent differences in the governance structures anticipated for Article 6.2 and Article 6.4 mechanisms, it is possible that different requirements and conditions will apply.[25]

Discussions on the operationalization of Articles 6.2 and 6.4 under the UNFCCC are at an early stage. In Paris, the UNFCCC Conference of Parties (COP) mandated the Subsidiary Body for Scientific and Technological Advice (SBSTA) to develop the guidance for cooperative approaches under Article 6.2, as well as the rules, modalities, and procedures for the mechanism under Article 6.4, for consideration and adoption by the CMA. Despite the current lack of detailed guidance, however, we can infer the following general characteristics of these mechanisms:

- Article 6.2 suggests a more bottom-up approach to establishing market mechanisms, and to the governance for such mechanisms. Mechanisms under Article 6.2 could be regulated and operated by bodies established at different levels, including at the pluri-national level (e.g., through so-called carbon clubs), at the bilateral level (e.g., the Joint Crediting Mechanism initiated by Japan), and by nongovernmental organizations. This may lead to more diversity of mechanisms and standards, and possibly less prescriptive international requirements for issues like baseline development.
- Article 6.4 establishes a centralized mechanism, with common criteria and standards, overseen by a central body to be appointed by the CMA. The rules, modalities, and procedures that are being prepared are likely to include guidance on baseline setting for crediting activities. This guidance will likely build upon existing practices, including under the CDM and JI.

25 Under the Article 6.4 mechanism, there will be common internationally agreed rules and modalities for emission reductions under CMA authority. Under Article 6.2, there could be multiple standards for ITMOs under the authority of participating parties; however, these standards may still operate under some common rules established by the CMA.

# 7 Conclusion

**Scaled-up crediting promises a novel approach for promoting cost-effective climate change mitigation, assisting host countries to achieve their climate policy goals, and enabling international cooperation** that can deepen the ambition of global efforts to address climate change. Rules around international crediting programs (scaled-up or otherwise) are still evolving, however, making the development and planning for scaled-up crediting approaches subject to uncertainty. Yet for scaled-up crediting to play a near-term role in international cooperation and in the implementation of NDC targets, planning, preparation, and development of these programs will need to begin soon.

**A central question is how to establish the baseline for a prospective scaled-up crediting program.** This is partly a technical, methodological challenge, but the biggest uncertainties arise from unresolved questions regarding international rules under Article 6 of the Paris Agreement, as well as how crediting programs may interact with (aiding or hindering) achievement of a host country's NDC commitments. This note has laid out some core principles that are likely to inform rules for crediting mechanisms under the Paris Agreement, and presented some options and preliminary considerations for how to establish baselines for scaled-up crediting programs in light of these principles.

**The most relevant principles are the requirements for cooperative approaches (e.g., emissions trading mechanisms) to maintain "environmental integrity," and — closely related — to avoid double counting of GHG reductions.** Avoiding double counting will likely require that countries adjust their GHG accounts to reflect any transfers of GHG reductions (i.e., using "corresponding adjustments"). Thus, a country that transfers away GHG reductions under a scaled-up crediting program would not be able to count those reductions toward achievement of its own NDC target. A key challenge, therefore, is understanding how a scaled-up crediting program may affect a host country's ability to meet its own NDC target. This may require elaboration of an NDC into a discrete emission pathway over time (i.e., by specifying absolute, multiyear GHG goals for the purposes of setting baselines for crediting), as well as some specification of how the sources or sectors covered by a crediting program are expected to contribute to NDC achievement.

However, such efforts take time, and it may make sense to establish a baseline prior to any final elaboration of NDC targets. In general, possible options include:

- ***Establishing a scaled-up crediting program only for sources* not *covered by the host country's NDC.*** This can avoid direct double counting risks, although interactions between crediting program sources and NDC-covered sources may still occur. Under this approach, a BAU or below-BAU baseline could be used, with appropriate adjustments to account for any potential interactions with NDC-covered sources.
- ***Establishing a scaled-up crediting program at sources covered by the host country's NDC*** and:
  - » Setting a BAU baseline, while restricting transfers to avoid over-transfer;
  - » Setting a below-BAU baseline, while potentially restricting transfers as appropriate depending on how the baseline ultimately relates to the country's NDC target (i.e., whether it is set above or below emissions levels required for meeting the NDC target); or

- Developing a baseline in conjunction with elaboration (or revision) of the country's NDC target, and ensuring that the baseline is aligned with the NDC target (i.e., it reflects a level of emissions from covered sources consistent with achieving the country's overall NDC target).

**Scaled-up crediting program baselines can be informed by or established using technical/analytical methods and tools already in use to model GHG emissions pathways, nationally and on a sectoral basis.** Modeling efforts such as those being used in PMR countries to better understand the effects of mitigation policies in the energy and buildings sectors, for example, could be adapted for establishing crediting program baselines.

**The primary considerations in establishing a scaled-up crediting program also go beyond baseline development,** as has been suggested in the note. The most significant challenges are likely to come in deciding how scaled-up crediting programs should complement a host country's overall climate and sectoral policy goals, and in coordinating baseline development — and overall crediting program development — with other aspects of national climate policy. Such coordination will be essential for successfully participating in international cooperative approaches under Article 6, and for navigating some of the outstanding questions around baseline development — including distinctions between conditional and unconditional NDC pledges, and how to accommodate blended finance arrangements.

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