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Reconciling Pretensions and Reality
The Situation-Ambition Approach for Dynamic Baselines under Article 6.4

Lukas Hermwille

Wuppertal Institut

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Internet
www.carbon-mechanisms.de
https://wupperinst.org/en/p/wi/p/s/pd/592/

Contact
Lukas Hermwille
Email: lukas.hermwille@wupperinst.org

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Wuppertal Institute for Climate, Environment and Energy GmbH
Döppersberg 19 • 42103 Wuppertal • Germany

www.wupperinst.org

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Summary

In the context of current NDCs, a fundamental dilemma is at the heart of designing market-based mechanisms: on the one hand, the mechanism needs to take account of the ambitious objectives of the Paris Agreement and of each Party's obligation to develop and maintain ever more ambitious climate policies towards these objectives. On the other hand, any mechanism can unfold its full potential only if it also recognizes the current deficits in climate policy.

To bridge the gap between ambition and current implementation, this paper proposes a novel approach for developing a crediting baseline for activities credited under the future Art. 6.4 mechanism. In particular, we suggest to calculate the crediting baseline as a weighted average of the IS margin representing the status quo of current (insufficient) levels of climate performance in the relevant area and the OUGHT margin – representing the transformative ambition that is required to meet the Paris objectives. A dynamic element is introduced by shifting the relative weight from the IS margin towards the OUGHT margin in the course of the crediting period.

The paper discusses different ways and means to determine the IS margin, the OUGHT margin and the dynamic transition factor determining weighted average between the two margins. The paper concludes by discussing the proposed concept and outlining further research needs.

1 Introduction

Market-based mitigation activities under Article 6 of the Paris Agreement are supposed "to allow for higher ambition (...) and to promote sustainable development and environmental integrity" (UNFCCC, 2016, Art. 6.1).

In the context of current NDCs, a fundamental dilemma is at the heart of designing market-based mechanisms: on the one hand, the mechanism needs to take account of the ambitious mitigation objectives and the obligation of each party to develop and maintain ever more ambitious climate policies towards these objectives. On the other hand, any mechanism can unfold its full potential only if it also recognizes the current deficits in climate policy as evident in the currently insufficient level of ambition in nearly all NDCs. An Art. 6 mechanism can meet the principles outlined above only if it helps countries to (over-)achieve their NDCs and provide a leg-up onto a transformative development pathway.

In this Policy Paper, we will introduce the Situation-Ambition Approach as a concept for dynamic crediting baselines that aims to bridge the gap between the imperfect and insufficient reality of climate action (the Situation) and the transformational pretensions of the Paris Agreement and its 1.5°C goal (Ambition).

In the context of international carbon mechanisms, the term "baseline" is used in various ways. Baselines specify reference scenarios to (1) determine the additionality of a proposed activity and (2) to determine the amount of emission reductions or avoided emissions achieved through a specific activity.

Activities should only receive transferable credits if they can demonstrate their additionality, that is that these activities would not have happened without support from the crediting mechanism. A baseline is used to represent the status quo of what is already present or available. The baseline therefore underpins the assessment of whether a proposed activity qualifies for a crediting mechanism (Michaelowa, Hermwille, Obergassel, & Butzengeiger, 2019).

The main concern of this Policy Paper, however, is the crediting baseline, which is used to quantify the mitigation effect of an activity. Historically, under the CDM (and many voluntary carbon crediting schemes) emission reductions were calculated on the basis of a hypothetical business as usual emission scenario. This scenario would quantify emissions occurring in all likelihood in the absence of a proposed project. The actual emission reductions were then calculated as the difference between the baseline emission scenario and the actually measured emissions of the implemented activity.[1]

Calculating baselines involves several types of parameters including activity data (e.g. feedstock used, output produced), emission factors (e.g. grid emission factors for electricity consumed / consumption avoided or substituted with renewable energy, or other default emission factors), as well as depending on the type of project further parameters. Each of these parameters can in theory be set as a constant or be adjusted over time. Many existing CDM methodologies already use baselines that feature dynamic aspects in specific parameters (also see Lo Re, Ellis, Vaidyula, & Prag, 2019).

[1] For sake of the argument we assume that any activities considered for application of the dynamic crediting baseline concept proposed below have already passed a rigorous additionality determination.

Parameters can also be dynamic in different ways. Firstly, they can change in a predetermined manner, e.g. by applying a predetermined growth rate. Secondly, they can be adjusted based on observed and measured changes in the respective parameters. The frequency of adjustments can also vary. Baselines can be adjusted periodically, e.g. monthly or annually, or only upon the renewal / extension of the crediting period.

Including dynamic elements in the crediting baseline is particularly sensible for areas of activities which itself are highly dynamic, e.g. being dependent on overall economic development or particular parameters that are prone to natural variations (e.g. weather). It is important to note that under the currently existing CDM methodologies examples can be found that include all variants of dynamic elements.

Yet under the Paris Agreement there is now another factor that should be considered in a dynamic manner: the level of ambition of domestic climate action. Under the Paris Agreement, now all Parties are obliged to periodically develop NDCs with each NDC presenting a progression beyond the then current level of ambition (Art. 4.3).

A purely static baseline approach is therefore clearly not compatible with the objectives of the Paris Agreement and the obligations it imposes on all countries. Applying the same approach would not account for the obligations to periodically increase the ambition of NDCs. Even if the implemented projects would help the host country to move towards decarbonization, in the accounting books (GHG inventories) it would still fix a high-carbon pathway, especially if the generated units are used to offset emissions elsewhere.

It is important to note, however, that the issue of ambition and dynamic / static character of the baseline are not to be conflated. In principle, it is possible to determine a very ambitious baseline with a static approach and it is just as possible to establish a dynamic baseline which lacks ambition. The question of dynamic vs. static baseline is rather a question of addressing uncertainties and anticipated changes. In order to ensure ambition is maintained, the principle of choosing baselines conservatively needs to be maintained.

In this Policy Paper, we will a present a concept to dynamically reflect the ambition of the Paris Agreement in the crediting baseline helping to design Art. 6.4 mitigation projects in a way that allows them to help host countries overachieve their NDCs and embark on a transformative pathway. The main proposal is based on predetermined adjustments of the baseline but can also be include periodic adjustments based on observed changes in the course of a mitigation activity's crediting period.

2 A Concept for Dynamic Crediting Baselines

As stated in the introduction, the practice of static crediting baselines must not be continued for the new Art. 6.4 mechanism. What is required is a new system that bridges the deficient status quo of climate policy – what IS – with the ambitions outlined in the NDCs and ultimately the objectives of the Paris Agreement – what OUGHT to be. To achieve this, we propose a dynamic baseline approach that marries these two perspectives.

The approach was inspired by the "combined margin" approach used in the methodological tool to calculate the emission factor for an electricity system (Thioye, Shrestha, Krieger, Burian, & Schnurr, 2018; UNFCCC, 2018, also see box below). Like in the tool for developing a grid emission factor, we propose to establish a Combined Margin. Equivalent to the Operating Margin we propose to develop the **IS-margin** representing the status quo of emissions / per-

The CDM's methodological tool to calculate the emission factor for an electricity system

The key concept of the tool to calculate an emission factor for electricity systems is the so-called "combined margin" emission factor. This emission factor is used to determine the CO_2 emission factor for the displacement of electricity generated with current infrastructure within a defined power system. This emission factor can then be used to calculate emission reductions for new power generation units (e.g. wind, solar, and hydro) or for energy efficiency measures which lead to reduced demand.

The challenge in determining the emission factor is the question what kind of power plants would otherwise supply the electricity in the absence of the project: the old existing stock of power plants or any newly built ones. The combined margin approach incorporates both perspectives: the "operating margin" represents the emission factor of the existing fleet of power plants, whereas the "build margin" (BM) represents the hypothetical power plant that would be affected by the proposed activity. The operating margin can be determined relatively easily based on historic data e.g. by calculating generation-weighted average CO_2 emissions per unit net electricity generation. Meanwhile, the build margin is calculated as the generation-weighted average of the most recently build units excluding plants that have been build more than 10 years ago.

The combined margin is then calculated as a weighted average of OM and BM. For wind and solar projects, the OM is weighted at 75% due to their intermittent and non-dispatchable nature. For other types of projects, OM and BM are weighted 50% OM / 50% BM in the first crediting period and 25% OM / 75% BM in subsequent periods.

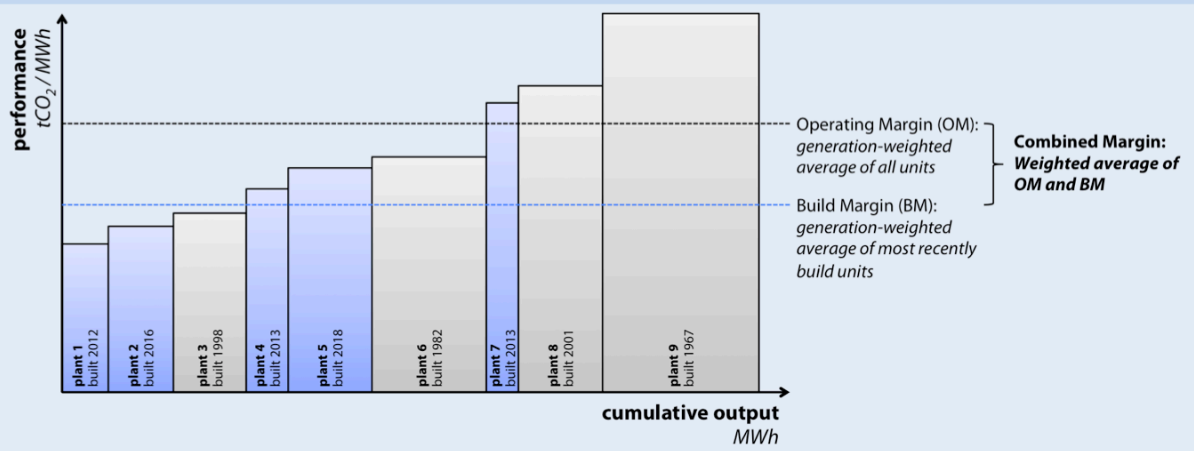

Figure 1: Schematic illustration of combined margin approach. Units shaded in blue are most recently build and were considered to calculate Build Margin. *Source: Wuppertal Institute.*

formance in a given field of application also reflecting the lack of ambition both in terms of targets as well as implementation thereof. Equivalent to the Build Margin, we propose to determine an **OUGHT-margin** representing the ambitious mitigation objectives.

The IS-margin is defined by the average performance of the sector. It can be developed using the same set of methodologies and tools developed for the CDM including the principle of conservative estimates. The OUGHT-margin can be defined in different ways. In **Figure 2** the OUGHT-margin is determined by an ambitious best available technology benchmark (see panel i), left hand side). Alternatively, the OUGHT-margin could for example be determined as a sector-specific breakdown of the NDC. A wide range of options could be considered, a selection of which will be discussed in section 3.2 below.

The dynamic element is introduced via a dynamic **transition factor** that determines the relative weight of the IS-margin and OUGHT-margin respectively (see panel ii of **Figure 2**, upper right hand side). The idea is that the crediting baselines gradually shifts emphasis from the IS-margin to the OUGHT margin over a predetermined period (e.g. over the implementing period of the then current NDC with *t* as the start year of the NDC and *t+1* as the target year). In the illustrated example, the crediting baseline will be exclusively determined by the IS-margin at *t* and similarly, the OUGHT-margin exclusively determines the crediting baseline at *t+1* (see panel iii of **Figure 2**, lower right hand side). In principle, however, other weightings and also non-linear transitions are also conceivable. The Policy Paper will discuss different options.

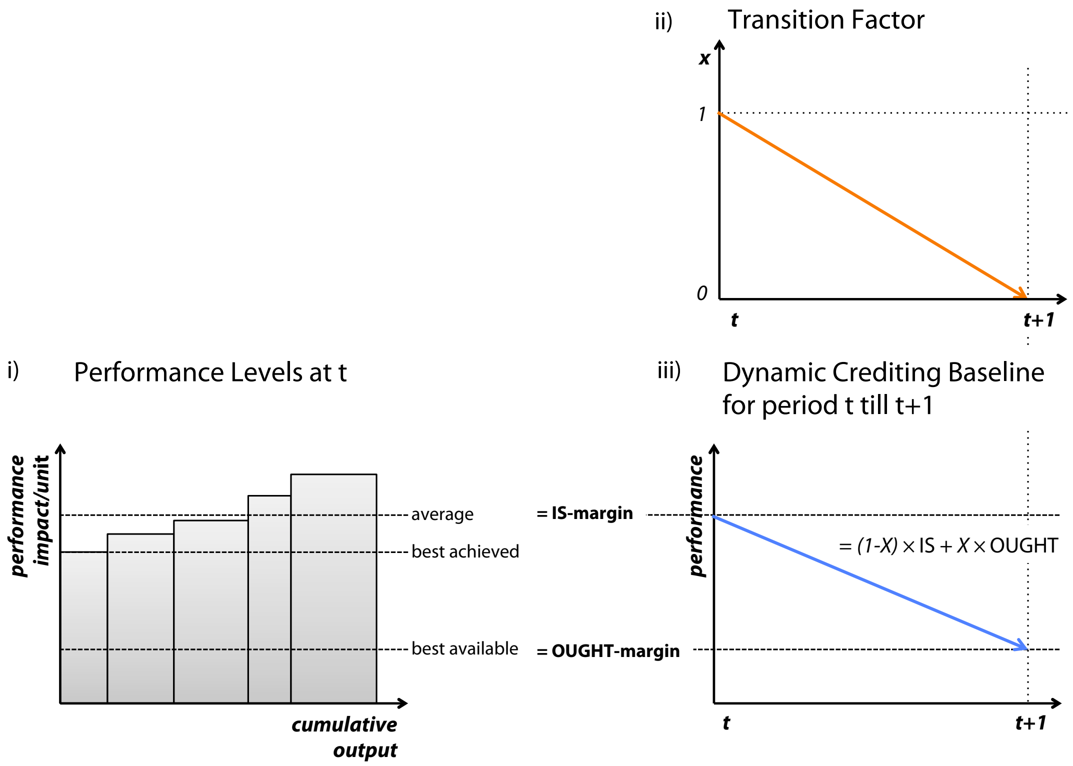

Figure 2: Schematic illustration of the proposed approach for a dynamic crediting baseline. *Source: Wuppertal Institute*

3 Design Options

In this section, we discuss various options to define key elements of the Situation-Ambition Approach for dynamic crediting baselines: how to determine the IS- and OUGHT-margin? And how to design the transition factor, i.e. what the appropriate timing for *t* and *t+1* is, what pathway the factor should follow and how it relates to the wider climate policy landscape, particularly the NDCs.

3.1 Options to determine the IS-margin

In principle, the IS-margin should adequately represent the current status quo at the point at which a mitigation activity is being proposed. Applying the principle of conservativeness should ensure that the IS-margin reflects the current status and not the (recent) past. For project-based activities, the IS-margin could be determined basically in the same way in which the crediting baseline is currently being determined, e.g. under the CDM (see UNFCCC, 2017).

Thioye et al (Thioye et al., 2018), for example, present an approach for determining grid emission factors in a "forward-looking" way. Their proposal effectively constitutes an evolutionary step beyond the existing standardized baselines framework applied to calculate (regional) grid emission factors for results-based financing schemes.

For larger-scale programmatic or policy activities, the status quo could be determined also at the aggregate level. This would of course require the availability of recent and good quality statistical data on the product or service being produced and the environmental performance of the supplying industry. The CDM Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines could serve as a starting point for further discussions on the eligibility / quality of statistical information for the purpose of the dynamic baseline approach (UNFCCC, 2014).

Another question is, whether and how often the IS-margin should be adjusted. In principle, there are two ways for how to address the challenge that the IS-margin is kept up to date and accurately reflects the status quo: one option would be to simply regularly update and recalculate the entire baseline, e.g. every three years. The appropriate interval would depend on the pace of development in the respective sector.

Alternatively, the IS-margin could be determined based on an algorithm that includes measurable and adjustable parameters. These parameters can then be adjusted based on observed changes without going through the entire process of determining and establishing the baseline. For example, a baseline for emissions from deforestation could be established on the basis of linear regression analysis determining the influence of specific parameters such as prices for certain commodities (e.g. agricultural products or charcoal), or population density. The resulting regression model can then be used to adjust the baseline emissions from deforestation based on the changes of the relevant previously identified parameters.[2] Moreover, the question of regular adjustments of the IS-margin depends on the scope of the pro-

[2] I am grateful to Martin Burian and Malte Krieger, GFA Consluting Group, for providing this example which has been applied in practice for a Forest Carbon Partnership Facility (FCPF) Programme in the Democratic Republic of the Congo (2016).

posed activity. As individual project activities are being considered, it is perhaps not practical to require project developers to periodically update the IS-margin in the course of the crediting period. And it may also not be necessary from an environmental integrity point of view, as over time the relative weight of the IS-margin decreases and the weight of the much more ambitious OUGHT-margin increases.

However, if a dynamic baseline is considered for scaled-up mitigation programmes or policies, or if it is considered as a standardized baseline applicable for an entire sector, the situation may be different. In this case, there is likely a much more prominent role for the host country and it may therefore be feasible to adjust the IS-margin as more recent statistical information is becoming available.

Finally, there is the question whether the adjusted IS-margin is only applicable for new projects or whether it also has an effect for ongoing projects either by affecting the crediting baseline already in the current crediting period or for potential extended / renewed crediting periods.

If adjustments of the IS-margin are to take effect for ongoing projects during the current crediting period, this would obviously have an immediate effect on mitigation outcomes of that project. **Figure 2** represents only the IS-margin at *t*. If the IS-margin were to be adjusted regularly to take into account actual developments, the resulting crediting baseline (blue line in **Figure 2**) would take on a convex shape (assuming that actual performance improves) rather than the linear shape represented in the figure.

While this more accurate representation of the status quo of climate policy would be desirable in principle, it could also potentially aggravate a problem that has been discussed widely in the literature on the CDM, namely the issue of perverse incentives to delay or not introduce mitigation policies (E- policies) as to avoid reducing the potential for revenue generating projects under the crediting scheme (for a recent discussion of the issue see, for example, Barata & Kachi, 2016).

While accuracy and integrity may speak in favour of adjusting the IS-margin continously throughout the project lifetime, the practical challenges speak against it. Given the fact that the relative weight of the IS-margin should diminish and give more weight to the OUGHT-margin over the course of the crediting period, the need for continuous adjustments may be reduced in the proposed Situation-Ambition Approach.

3.2 Options to determine the OUGHT-margin

While the IS-margin is essentially an extension of existing concepts, the OUGHT-margin is a conceptual innovation and therefore merits a more detailed discussion. While the IS-margin aims to accurately describe the empirical status quo, the OUGHT-margin introduces a normative component to the equation. The idea, of course, is that the OUGHT-margin represents the transformative ambition of the Paris Agreement. The question basically is, how this can be best achieved in a pragmatic way.

The first and most obvious point of departure would be to **develop the OUGHT-margin based on NDCs.** For example, countries that have specified a target for the power sector such as India (40 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030) or various small island states that have committed to 100% renewables, this target could be translated into an OUGHT-margin relatively easily. For many other sectors, though, it would be required to break down the aggregated NDC into sectoral targets and develop the

OUGHT-margin as an extension / interpretation of NDC implications for the corresponding sector or subsector.

However, as has been discussed elsewhere (Hermwille & Obergassel, 2018; Michaelowa et al., 2019), many NDCs are not ambitious enough or even include hot air. If the NDC itself does not reflect the ambitious pretensions of the Paris Agreement, extending and translating the NDC would not yield an adequate OUGHT-margin.

To avoid this, more objective standardized methods could also be applied. The most salient approach that could be used would be **benchmarking on the basis of best available technologies (BAT) for the development of the OUGHT-margin** (for an extensive discussion of benchmarking see Füssler, Oberpriller, Duscha, Lehmann, & Arens, 2019).

It is important to note that the concept of BAT can be used in very different ways, particularly in view of what "available" means. The most stringent form would entail the most advanced technology commercially available anywhere on the globe. Other definitions also include economic considerations. For example, the Industrial Emissions Directive (IED) of the European Union specifies that "the available techniques means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, ... as long as they are reasonably accessible to the operator" (European Parliament and European Council, 2010; also see Füssler et al., 2019). For the OUGHT-margin, the former understanding is more appropriate, i.e. considering best available technology as what is technically possible but may not have been achieved in practice.

One of the challenges with BAT benchmarks is that best available technology benchmarks may be too stringent to still incentivise investment (Füssler et al., 2019; Prag & Briner, 2012). If the benchmark is directly used as a crediting baseline, the resulting emission reductions calculated based on the difference between actual performance of the project and the benchmark performance simply may be so low that the proceeds from selling the credits may not be enough to cover additional costs. However, if BAT benchmarking is used to determine the OUGHT-baseline, this is problem is slightly reduced since the crediting baseline is determined by a combination of both OUGHT and IS-margin. BAT benchmarking therefore seems to be almost ideally suited to determine the OUGHT-margin, yet as Füssler et al (2019) highlight, the approach is by no means a silver bullet. It can only be applied meaningfully in a limited number of sectors.

According to Füssler et al. (2019), there is ample potential for use of performance benchmarking for the Article 6.4 Mechanism. In particularly, they highlight the need for high quality performance data in the sector. Moreover, benchmarks should only be applicable for similar products, i.e. sectors with non-homogenous products such as the chemical industry are less well suited. The authors attest that a particularly high potential for benchmarking exists for process emissions in industry (e.g. CO_2 emissions from clinker production in the cement industry or N_2O emissions from adipic acid production). The potential for product benchmarks is limited to highly homogenous products such as steel or aluminium or other metals. Electricity generation is another obvious candidate, but for many other sectors the potential is limited, they suggest. For those sectors where sectoral or sub sectoral benchmarks are feasible, a standardized approach would be preferable according to which a dynamic baseline is determined at the national level and applicable for all activity proponents in the corresponding sector.

The **OUGHT-margin could also be developed on the basis of long-term deep decarboniza-**

tion scenarios provided in the academic literature including the work of the IPCC. The IPCC heavily relies on the results of integrated assessment models (IAMs) to identify mitigation pathways compatible with 1.5°C or "well below" 2°C of global mean temperature increase above pre-industrial levels. The scenarios developed with these IAMs contain detailed information about the use of technologies. Kuramochi et al (2018) have demonstrated how global benchmarks can be derived from this scientific literature. In a similar vein, the information used for the IPCC and made available in by the IAMC 1.5°C Scenario Explorer hosted by IIASA (IIASA, 2019) could be used to establish benchmarks at least on the level of world regions.

The Science-based Targets Initiative (SBTI), a collaboration between CDP, World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UNGC), could lend inspiration. The SBTI has developed a methodology and tool to derive mitigation targets at the company level that are aligned with the Paris Agreements 1.5°C goal (SBTI, 2019). In a similar vein, targets could be broken down at national level and / or sectoral level.

Finally, a technically straight forward yet politically charged approach would be to **accept zero emissions as long-term benchmark for the OUGHT-margin.** Ultimately, all sectors need to phase out GHG emissions, especially energy-related CO_2 emissions. While a series of countries (and subnational jurisdictions) have already established climate neutrality and / or decarbonization targets, for many developing countries it may be politically challenging if not impossible to adopt a fixed target year for achieving this objective.

While the previously discussed approaches would be most suitable if applied at the sectoral level, i.e. with prominent involvement of national authorities, the dynamic baseline approach could also be applied at the individual project level. As discussed above, building on the CDM's Combined tool to identify the baseline scenario and demonstrate additionality (UNFCCC, 2017), one could use the existing approach for baseline determination for the IS-margin. The OUGHT-margin can be also determined based on information that is anyway required for the existing tool. One of the first steps of the tool is to identify all alternative scenarios including all alternative technical options to provide the same service or product. The **OUGHT-margin could be determined by the best option available in terms of environmental performance** that is not impeded by any technological barriers (e.g. non-existing technical potential for certain renewable energy technologies or substitute materials to replace clinker content in cement not being available within a meaningful distance from the project cite etc.). As a default, even the project itself could determine the OUGHT-margin.

3.3 Options for the pathway of the transition factor

The transition factor and the transition period (*t* to *t+1*) determine relative weight of the IS-margin and the OUGHT-margin. In plain language, the transition factor can be understood to represent a normative commitment of how fast the host country should switch tracks onto a transformative low-GHG development pathway.

In this section, we discuss ways to design the transition factor. A key requirement is that the transition factor should be compatible with the OUGHT-margin and the way in which it has been determined.

Let's first consider the case in which the OUGHT-margin is determined on the basis of BAT performance benchmarks or as described above in the case of individual projects in which the best available technology (or as a default the technology proposed for the credited activity) is used. In that case, the transition factor / transition period reflects how quickly the best available technology or the technology used in the proposed activity ought to become common practice in the host country.

But how fast should that be achieved? Arguably, the answer to that question should not be the same for all kinds of sectors and types of projects. For technologies with very long technical lifetimes (e.g. power sector infrastructure or production plants in emission intensive industries), a longer transition period may be appropriate than for sectors with short technical lifetimes of the capital stock, which presumably should be able to appropriate innovative low-GHG technologies faster than others. Scientific literature and in particularly the outputs of IAM models that underpin the IPCC pathways may also be informative about when certain technologies should become common practice in order to save chances of limiting global warming to no more than 1.5°C.

In those cases where the OUGHT-margin has been determined by way of translating and breaking down the NDC of a host country, the transition period should obviously reflect the timetable of that NDC. A new and updated NDC would also have to trigger the adjustment of the OUGHT-margin. While this may not be feasible for projects already implemented, it would certainly be required for dynamic baselines that are being maintained at the sectoral level with the involvement of national authorities.

Theoretically, it would also be possible to derive the OUGHT-margin from the long-term low GHG emission development strategies (LEDS) that Parties are invited to prepare in accordance with Art. 4.19 of the Paris Agreement. In that case, the corresponding reference date for that strategy – most LEDS currently focus on 2050 – should also be the target date of the transition factor for dynamic baselines.

Finally, please note that the transition period does not need to be identical with the crediting period of the project. While this would seem convenient from the point of view of a project proponent, it may not be adequate given the discussion above. For instance, if the OUGHT-margin is calculated on long-term strategies or climate neutrality targets with a target year several decades ahead, aligning transition period and crediting period could lead to crediting periods that extend beyond the project lifetime.

A key argument for shorter crediting periods is that uncertainty involved in the hypothetical scenarios used to determine the project's additionality and crediting baseline increases into the future. Including dynamic elements into baseline setting could remedy this issue to some extent. Still the question of adequate length of crediting period needs to be discussed separately.

4 Discussion and Conclusions

The Situation-Ambition Approach for dynamic crediting baselines for Art. 6.4 activities introduces a normative component into the what has been so far a purely technical process. While including this normative component is certainly politically challenging, we would argue that doing so is required in order for the Art. 6.4 mechanism to actively contribute to normative pretensions of the Paris objectives. By no means do we think that the proposed concept is the perfect solution for the conundrum. But it may be considered as a pragmatic compromise. It bridges negotiation positions by bringing together those who hold up the transformative ambition the Paris Agreement and those who want to ensure continuity from and exploit the trove of experiences from existing mechanisms, particularly the CDM. Taking inspiration from existing concepts, the approach may also be easily understood avoiding further complication in an increasingly complex field. Moreover,

Beyond these generic points, we would like to discuss specific implications of the proposed approach for project developers: first and most obvious, the dynamic approach would likely yield fewer mitigation credits than the previous static approach which only considered the status quo. But essentially this outcome is a corollary of the obligations of conduct specified in the Paris Agreement, particularly its Art. 4. Any approach that takes Parties' obligation to develop progressively more ambitious NDCs "reflecting the highest possible ambition" (Art. 4.3) will have to reduce the number of credits available for transfer and ultimately offsetting of mitigation contributions elsewhere.

It is important to note, however, that the approach limits the generation of credits, but not necessarily revenues as they also depend on prices. Limiting the supply of credits may increase prices (especially if demand for credits is limited) and hence offset at least some of the effect.

Perhaps even more important than the overall volume of the revenue stream is its predictability. A predictable stream will make or break the financing of the project. The proposed Situation-Ambition approach (especially if the IS-margin is not adjusted during the crediting period) offers a high degree of predictability. Including the normative component of the OUGHT-margin might even increase certainty and predictability as it explicates and quantifies anticipated future developments in the sector, making it more transparent for investors and lenders.

As discussed above, the Situation-Ambition Approach in effect leads to a steadily declining output of mitigation units over the course of the crediting period. For investors, this might be a good thing. Assuming constant prices, the bulk of revenue will accrue in the first years after successful implementation of the project. Taking into account discount factors, the present value of the revenue stream would be higher in such a scheme than if it were equally spread over the crediting period.

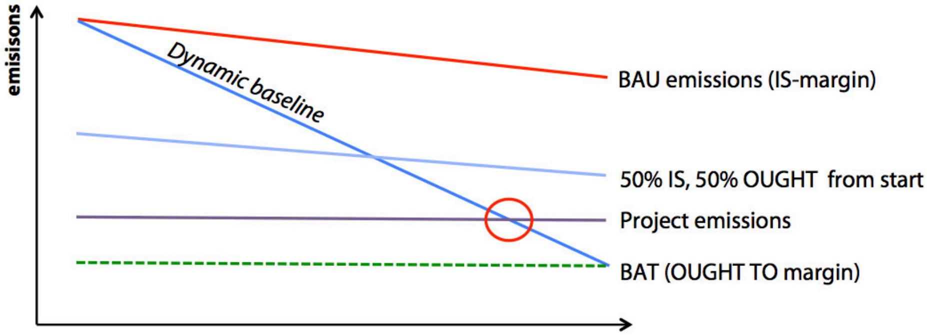

Figure 3: Alternative scenarios for determining the combined margin from IS and OUGHT-margin and its effect on mitigation incentives for project developers. *Source: Lambert Schneider.*

On the other hand, the decreasing revenue stream may also threaten projects that depend on a continuous revenue stream to maintain operation. If the revenue stream is not sufficient to cover operation and maintenance cost of the mitigation equipment used in the project, the actual mitigation activity may be stopped and the underlying economic activity continue unabated. **Figure 3** illustrates this case. Assuming the dark blue crediting baseline is applied, the corresponding project would not create any addition mitigation units beyond the intersection point of the project emissions and the crediting baseline (highlighted in red).[3]

One way to remedy this issue would be to adjust the volume of outputs in terms of mitigation units by altering the transition factor. Above we proposed that the factor should transition from weighing the IS-margin 100% (and 0% OUGHT-margin) to 0% (and 100% respectively) (reflected in the dark blue line). Alternatively, one could apply any other combination of weights, e.g. applying a 50%/50% weighting of IS and OUGHT-margin throughout the crediting period (light blue line). This would shift and more evenly distribute the revenue stream across the crediting period and hence resolve the issue.

Alternatively, the problem could be addressed by means of adjusting the prices (instead of the volume of mitigation units). Prices could be adjusted for example by incorporating predetermined price increases to offset some of the reduced output in a long-term purchase agreement with the project developer.

Still, it is important to note that having an even distribution of revenues is not necessarily a problem for all project types. It only applies to those projects that feature relevant operation and maintenance costs and do not generate separate revenue that could also cover the mitigation costs. Renewable energy projects, for example, would not be affected by this (see for example Warnecke, Day, & Klein, 2015).

As stated above, this Policy Paper is not intended to close a discussion but to open it. It effectively constitutes a concept note. Many questions remain unanswered and warrant further research. For example, subsequent research should look in detail into different project types and areas of mitigation activity and discuss which approaches for defining the IS and OUGHT-margin in specific contexts. A starting point for such analysis could be the list of criteria for assessing baseline approaches developed by Lo Re et al. (2019, p. 27). Their list includes:

[3] We are grateful to Lambert Schneider, Öko-Institut for providing detailed feedback and among other things pointing out this potential unintended consequence of the proposed dynamic crediting baseline approach.

- compatibility with the principle of conservativeness;
- predictability of total abatement;
- ease of application with limited data;
- ease of establishing activity boundaries;
- objectivity in establishing the baseline
- and objectivity in applying the baseline

One particular nut to crack for future research is how to break down aggregate long-term objectives (either in NDCs, long-term low GHG emission development strategies or independently developed and scientifically rigorous scenarios/pathways) to specific sectors and translate them into a viable OUGHT-margin.

Finally, it would be highly informative for future debate to actually quantify the effects the Situation-Ambition Approach may have on specific projects. One could try and develop a dynamic baseline for an existing mitigation project, either from the CDM or any results-based financing scheme, and compare the outcomes with the actual scheme.

Overall, we hope that with this contribution, we can kick-off a more constructive debate about how market-based mechanisms can become a supporting act not only in achieving compliance with NDCs but actually help countries to embark on transformational pathways in line with the Paris objectives.

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Wuppertal Institute
for Climate, Environment and Energy
P.O. Box 100480
42004 Wuppertal
GERMANY

www.wupperinst.org