

CARBON MECHANISMS REVIEW

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Ensuring long-term ambition

Paris-proofing of baseline setting as a means for alignment with the Paris Agreement's long-term objectives

Inclusiveness needed

Capacity building needs for a balanced Article 6

Content

Autumn 2021



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editorial

Dear Reader!

Baseline setting for carbon market activities has long been a question of comparing a scenario of what would have happened without the intervention and a development induced by the project activity. But what happens when business-as-usual development becomes dynamic, i.e. NDCs becoming ever more ambitious as required by the Paris Agreement? Scholars and negotiators alike have dealt intensively with this issue and further challenges for baseline setting, but have yet to cut the Gordian knot.

In this issue of the CMR, we take an in-depth look at the baselines discussion, starting with an analysis of the experience gained in the different carbon market arenas so far. We also present a Party perspective on the negotiation process and possible solutions for the associated agenda items. The cover feature is supplemented by a new proposal from the research community on how to technically solve baseline setting under the new Paris Agreement regime.

Also in this issue, we look at how implementation of Article 6 activities can be promoted and assess actual capacity building needs. Finally, we explore the aviation sector and analyse the role of carbon markets in regulating GHG emissions from aviation as described in the European Commission's recent "Fit for 55" proposal.

Enjoy the read!

Christof Arens
Editor-in-chief



Carbon Mechanisms Review (CMR) is a specialist magazine on cooperative market-based climate action. CMR covers mainly the cooperative approaches under the Paris Agreement's Article 6, but also the broader carbon pricing debate worldwide. This includes, for example, emission trading schemes worldwide and their linkages, or project-based approaches such as Japan's bilateral off-setting mechanism, and the Kyoto Protocol's flexible mechanisms CDM/JI. CMR appears quarterly in electronic form. All articles undergo an editorial review process. The editors are pleased to receive suggestions for topics or articles.

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Ensuring Ambitious Baselines

Baseline approaches under Article 6.4

by Kazuhisa Koakutsu, Director of International Negotiations, Market Mechanisms Office, Ministry of the Environment, Japan (MOEJ) and Kentaro Takahashi, Deputy Director, Climate and Energy Area of the Institute for Global Environmental Strategies (IGES)

The Paris Agreement was adopted in 2015 at the twenty-first session of the Conference of the Parties (COP21) in Paris. Article 6 of the Paris Agreement (PA) recognizes that some parties choose to pursue voluntary cooperation in the implementation of their nationally determined contributions to allow for higher ambition in their mitigation and adaptation actions and to promote sustainable development and environmental integrity. There are 3 mechanisms under Article 6 of the PA (Article 6.2, Article 6.4 and Article 6.8). Article 6.2 is a kind of mechanism that allows participating Parties to use international transferred mitigations outcomes (ITMOs) to achieve nationally determined contributions. This mechanism will also enable bilateral and regional mechanisms to transfer emission reductions. For the future implementation of this mechanism, Article 6.2 guidance must be adopted. Article 6.4 is a new mechanism supervised by a body established under the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA). For this mechanism, Article 6.4 rules, modalities and procedures are necessary to operationalize the implementation. Article 6.8 is a non-market based approach which provides finance, adaptation and capacity building support. This mechanism will require the adoption of the work programme for its further implementation.

COP15 requested the Subsidiary Body for Scientific and Technological Advice (SBSTA) to develop a series of rules for Article 6 so they could be decided on by the CMA at its first session. Article 6 rules were originally to be decided at COP24 in Katowice in Poland in 2018. However, the Parties were unable to achieve a consensus in 2018 and in 2019 due to several outstanding issues (adaptation, corresponding adjustment under Article 6.4 and transition of Kyoto units). As COP26 was postponed in 2020 because of the Covid-19 pandemic, the SBSTA Chair's informal technical expert dialogues were organised several times in 2020 and 2021. The second half of the informal dialogues will be scheduled from 23rd September to mid-October to resolve several issues (reporting and review cycle per Article 6.2 guidance, Clean Development Mechanism (CDM) transition, governance and timelines for the Article 6.8 framework, implementation of cooperative approaches using non-GHG metrics per Article 6.2 guidance, baselines and additionality for the Article 6.4 mechanism and overall mitigation in global emissions, OMGE). This article focuses on the baseline discussion based on COP25 presidency texts.



Source: *Cement never sleeps* by Simon Davis/DFID (<https://flic.kr/p/ekNADH>) / Flickr / CC BY 2.0 (<https://creativecommons.org/licenses/by/2.0/>)

Business as usual? Baseline setting is challenged by the requirements of the Paris Agreement.

Ideas on baseline approaches under the Article 6.4 mechanism

COP25 in Madrid developed three texts under Article 6.4. According to the COP25 presidency texts, many options for baseline approaches were proposed. The differences between the versions in relation to baseline approaches are summarized in Table 1. Although COP25 presidency text Version 3 finally proposed that “the CMA shall adopt principles for methodologies and baseline and additionality approaches”, COP25 presidency text Version 1 and Version 2 provided a larger set of

choices (‘menu’) so that project participants who will join Article 6.4 can select several options by taking into consideration the situation regarding project, region and country.

Menu versus hierarchy approach

According to the guiding questions which were prepared for the Climate Dialogues (informal meeting of Article 6 experts related to baselines and additionality in the Article 6.4 mechanism organised on 26 November 2020), one of the discussion points was whether or not Parties should select a hierarchical approach as baselines. The

Table 1: Different versions of COP25 presidency texts under Article 6.4

Version 1	Version 2	Version 3
<p>Option A</p> <ul style="list-style-type: none"> ■ Performance-based approach ■ Business as usual emissions ■ Historical emissions <p>Option B</p> <ul style="list-style-type: none"> ■ Best available technology ■ Performance-based approach ■ Benchmark baseline <p><i>For projects not applied above</i></p> <ul style="list-style-type: none"> ■ Projected emissions ■ Historical emissions <p>Option C</p> <ul style="list-style-type: none"> ■ <i>Performance-based approach</i> <p><i>For projects not applied above</i></p> <ul style="list-style-type: none"> ■ An alternative approach can be proposed, with the approval from the host Party and a justification. 	<p>Option A</p> <ul style="list-style-type: none"> ■ Best available technology ■ Performance-based approach ■ Benchmark baseline <p><i>For projects not applied above</i></p> <ul style="list-style-type: none"> ■ Projected emissions ■ Historical emissions <p>Option B</p> <ul style="list-style-type: none"> ■ Performance-based approach <p><i>For projects not applied above</i></p> <ul style="list-style-type: none"> ■ An alternative approach can be proposed, with the approval from the host Party and a justification. 	<p>The CMA shall adopt principles for methodologies and baseline and additionality approaches.</p>

(Version 1 para 5(b), Version 2 para 5(b), Version 3 para 5(c))

In the context of developing and approving new methodologies for the mechanism, review the baseline and monitoring methodologies in use for the clean development mechanism under Article 12 of the Kyoto Protocol and other existing market-based mechanisms.

CDM and other existing mechanisms provide multiple options to set baseline approaches based on the project type. Article 6.4 may follow the same approach when designing the baseline approaches in the future.

Multiple definitions can be found based on the current negotiation texts in the COP25 presidency texts. Box 1 summarises the type of baseline approaches. CDM also defines the baseline approach in paragraph 48, Modalities and procedures for CDM adopted by the Conference of the Parties

Box 1: Types of baseline approaches**Best available technologies**

- Represent an economically feasible and/or environmentally sound course of action

Performance-based approach

- Taking into account (i) technologies that represent an economically feasible and environmentally sound course of action; (ii) the emission of activities providing similar outputs and/or services in similar social, economic, environmental and technological circumstances; (iii) Barriers to investment
- Where a baseline is based on the emissions of activities providing similar outputs and/or services in similar social, economic, environmental and technological circumstances
- Where the baseline is set at least at the average emission levels of the best performing comparable activities providing similar outputs and services within a defined scope and boundary in the past three years and where the host Party may determine a more ambitious level at its discretion

Benchmark baseline approach

- Where a baseline is based on an ambitious benchmark representing a level of GHG emissions for activities within a defined scope and boundary

Projected emissions

- Where a baseline is based on projected emissions, as applicable

Historical emissions

- Where a baseline is based on existing or historical emissions, as applicable

Serving as the meeting of the Parties to the Kyoto Protocol (CMP). For further work under Article 6.4, the definition of various approaches will be required to clarify and understand more concepts. Once the definition of baseline approaches is decided at COP26, detailed concepts such as how to secure environmental integrity should be adopted by the supervisory body established under the Article 6.4 mechanism after COP26. However, the

most important element in the COP26 decision will be a concept of “below BAU” and this should be included in the decision at minimum. In addition, as mentioned in the COP25 presidency texts, each mechanism methodology shall be consistent with the NDC and long-term low GHG emission development strategy of the host party and the long term goal of the PA.

Experiences of existing mechanisms from the CDM and the Voluntary Carbon Market

Baseline approaches under the CDM

As of 22 September 2021, 7,845 CDM projects have been registered. To calculate greenhouse gas emission reductions, CDM project participants apply a methodology approved by the CDM Executive Board (EB). Currently, more than 200 methodologies have

been approved by the CDM EB. According to CDM Modalities and Procedure paragraph 48 (a) to (c), there are 3 types of baseline approaches as shown in Box 2. Approximately 50% of all approved methodologies apply only type (a) and 20% apply several types of baseline approaches.

Baseline approaches under VCS

In the VCS, each methodology is required to be below BAU in “Methodology Requirements” to prove additionality of the proposed activity.

Example: “A project activity is additional if it can be demonstrated that the activity results in emis-

Box 2: Types of baseline approaches defined in the CDM M & P

- a) Existing actual or historical emissions, as applicable
- b) Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment
- c) The average emissions of similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 per cent of their category.

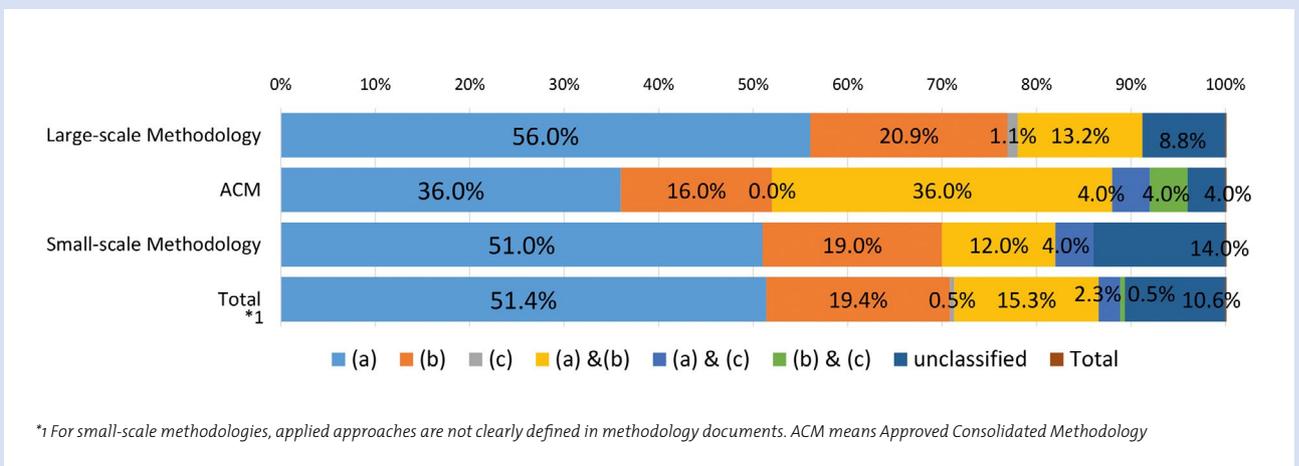


Figure 1: Categorization of baseline approaches in the approved methodologies under the CDM. Source: Ministry of the Environment Japan 2021

Box 3: Types of baseline approaches under VCS

- a) Performance method: These methods establish performance benchmark metrics for determining additionality and/or the crediting baseline. Projects that meet or exceed a predetermined level of the metric may be deemed as additional and a pre-determined level of the metric may serve as the crediting baseline.
- b) Activity method (positive list): These methods pre-determine additionality for given classes of project activities using a positive list. Projects that implement activities on the positive list are automatically deemed as additional and do not otherwise need to demonstrate additionality. One of three options (namely activity penetration, financial feasibility or revenue streams) is used to qualify the project activity for the positive list
- c) Project method / Others / Unclassified



Figure 2: Categorization of baseline approaches in the approved methodologies under the VCS. Source: Ministry of the Environment Japan 2021

sion reductions or removals that are in excess of what would be achieved under a “business-as-usual” scenario and the activity would not have occurred in the absence of the incentive provided by the carbon markets.”

VCS allows the use of 2 types of standardized methods, Performance method and Activity methods, and also the use of other baseline approaches depending on each project type.

Lessons learned from the Joint Crediting Mechanism (JCM)

The JCM has more than 90 approved methodologies in 17 JCM partner countries. In the JCM, types of baseline approaches are not clearly defined,

but baselines should be below business-as-usual (BAU). Each approved methodology is developed compared with economically feasible and environmentally friendly technology, data with good carbon efficiency, and the currently feasible efficiency. Emission reductions to be credited are defined as the difference between “reference emissions” and project emissions. The reference emissions are calculated below BAU emissions which represent plausible emissions in providing the same outputs or service level of the proposed JCM project in the partner country. This approach will ensure a net decrease and/or avoidance of GHG emissions.

Box 4: Types of baseline approaches defined in the JCM

- a) Based on economically feasible and environmentally friendly technology (Positive list)
- b) Based on data with good carbon efficiency from the latest past data of existing or similar equipment (Performance)
- c) Based on the target standard and the efficiency set to exceed the currently feasible efficiency (Benchmark)

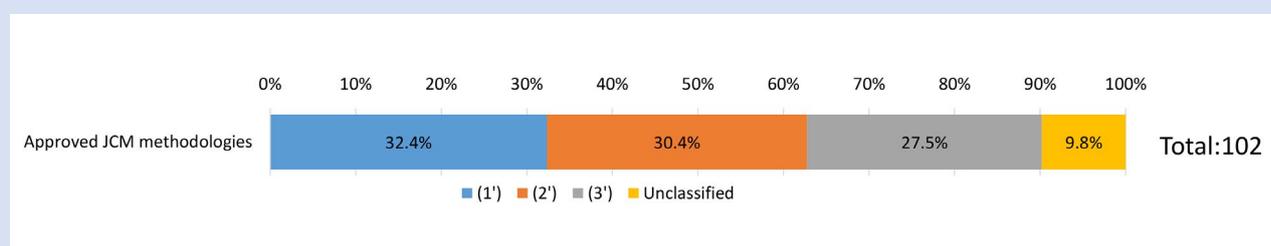


Figure 3: Categorization of baseline approaches in the approved methodologies under the JCM.
Source: Ministry of the Environment Japan 2021

Towards COP26

We are only 40 days away from COP26. The SBSTA Chair plans to organise a series of informal consultation meetings related to Article 6 of the PA before COP26. These informal consultation meetings will be a last chance to reach further understanding among Parties. The baseline and additionality session will be scheduled on 14 October and it is hoped that further progress will be made ahead of COP26. Since it is expected that the SBSTA will discuss the current texts in the first week of COP26, more technical discussions will be necessary to find common ground before we start high level discussions in the second week of the CMA.

Taking the long-term Perspective

Baseline methodologies and responding to the challenges of Paris

by Martin Hession, European Commission

The adoption and implementation of the Paris Agreement challenges many of the assumptions and practices that have long underpinned the international carbon market: the aim of climate neutrality and the commitment to progressively more ambitious mitigation action beyond the club of developed countries in the form of diverse nationally determined contribution and long-term strategies provide a different context to that offered by the Kyoto Protocol. Rather than a world in which some parties accounted for emissions budgets, and other parties offered mitigation opportunities in return for sustainable development benefits, all Parties now have mitigation goals and accounting obligations in respect of them.

A New Mechanism in a New Framework

The adoption of an emissions-based approach to accounting enables rules on avoidance of double counting to be developed by a process of adjustment to emissions rather than to budgets derived by targets, and offers flexibility but also presents many challenges. Fitting the new mechanism adopted to replace the CDM and JI within this a framework in a way that contributes to the diverse commitments of all parties involved, and to the overall goal of the agreement is no more challenging.

Nevertheless, the Paris Agreement calls in Article 6, and in particular the Article 6.4 mechanism, to contribute to delivery of diverse commitments, and like any other market Article 6 activities will need to stay within the boundaries of these commitments to be credible or effective.

The objectives and aims of Article 6.4 are distinct from those of the CDM, and they challenge the practices and assumptions of the CDM:

- Host countries now have contributions of their own to manage and account for, and cannot therefore afford to credit at levels that will leave them short.
- Host countries have an interest in preserving access to cheap abatement potential towards current targets, and when considering progression avoiding long-term commitments to export this potential abroad.

This represents a considerable challenge for many hosts, who now need actively to consider the contribution of international markets to their short-term objectives for the first time.

We know that to achieve net zero emissions in the mid-century, human induced emissions need to fall to the lowest feasible level rapidly, and that human induced removals need to increase in the same timescale to cover these residual emissions.

On the road to net-zero, options for offsetting emissions with emissions reductions contract, and the scope for offsetting emissions with removals is also limited.

We also know that current targets for emissions and removals are not sufficient to get us there, and if these are used as the sole reference for credit allocation this is likely to lock-in high emission development paths.

What does this mean for baselines?

In more concrete terms this means at the very least that access to abatement activities by host countries need to be carefully managed and aligned with short term and longer term strategies.

More concretely still, it means that approaches to crediting based on historic emissions or removal rates, or business-as-usual projections are no longer appropriate. As crediting periods typically transcend NDC periods, and NDCs need to be progressively more ambitious, Parties can no longer afford to simply align their crediting approaches with current policy but they need to consider the longer term perspective.

There is an expectation that existing approaches under the CDM and designed for the Kyoto Framework can be applied under Paris, or that these approaches if modified and updated can meet the challenge of progressively more ambitious NDCs and Long Term Strategies for both buyer and host country. The EU has consistently taken the view that this is not the case, and that allocations to any market will need to stay within the boundaries for a trajectory to net zero, and double counting avoided if Article 6 is to contribute to national and overall goals and objectives.

Article 6.4 needs to work in the host party interest

It is this understanding that lies at the heart of the controversy over the issue of baseline methodologies and approaches under Article 6.4, and where, given many hosts will rely on the mechanism to protect their interests, there is a particular responsibility on the international community to get it right.

There are two elements to the EU position on the ambition of the mechanism:

- the first expressed as the need to the mechanism to respond to the policy directions of the host with respect to its own NDC,
- and the other with respect to the definition and application of default baselines approaches to activities.

The former does demand of hosts clarity as to how their use of mechanism will contribute to their NDC, and places a responsibility on the Supervisory Body of the mechanism to ensure that these intentions are respected in implementation.

The latter demands a change of approach to baseline setting insisting on an approach that credits the highest performing activities, and credits improvements on benchmark emissions, with the benchmark fixed in relation to what is objectively already available, rather than what has happened in the past, or would happen if no intervention was made.

The CDM requires relatively little of hosts, other than that they approve a project and confirm sustainable development benefits. It then for the most part credits improvements on historic or projected emissions, occasionally applying benchmarks for emissions based on what has been deployed in the last 5 years.



Source: Installing panels by Oregon DOT (<https://flic.kr/p/aDj4sc>) / Flickr / CC BY 2.0 (<https://creativecommons.org/licenses/by/2.0/>)

Responding to policy provisions: host countries need to clarify how their use of the Art. 6 mechanism will contribute to their NDC.

General Outline of Proposals

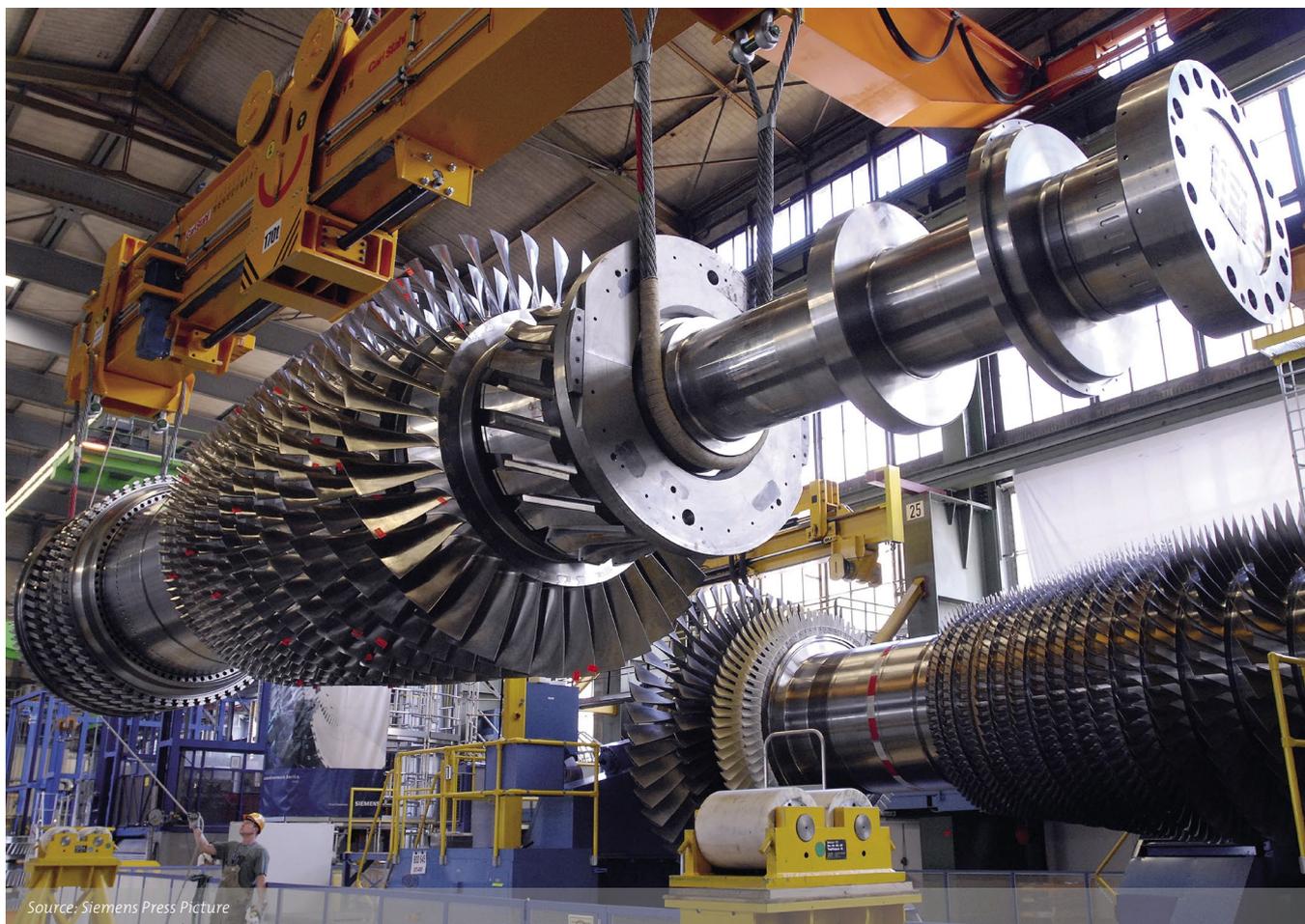
The EU has proposed

- First, that host countries take a more active role in defining what can be credited and on what conditions, and that they be supported in developing implementation plans that integrate use of the mechanism in their broader strategies.
- Second, that the Supervisory Body is placed under a duty to support and implement these strategies, and implement the mandated choices of hosts as expressed in these plans.

- Third, that crediting should be offered not simply to additional but to transformational projects,
- Fourth, that crediting levels fixed at a minimum with reference to technologies and techniques that are currently available though perhaps not deployed.

Criticisms

There are several criticisms of these approaches not all of which we subscribe to, and none of which we consider insuperable:



Source: Siemens Press Picture

System change: the EU wants to see crediting primarily available to transformational activities.

That hosts have limited capacity to undertake the necessary assessments and that application of host choices may lead to a fragmented market. That the Supervisory Body might be better placed to make choices for the host, and offers a guarantee of higher integrity.

That the proposed baseline approach is new and resource-intensive and will be difficult to implement, there are judgements involved and data is not always easily available. That it may be difficult to apply in the forestry or land sector.

That what is available in one place may not be available in another, that technology and techniques may favour one

actor over another. That some project type may be excluded, and that crediting levels will be restricted.

Response to these criticisms

Many of these criticisms could address any system, but given the constraints within which the mechanism will need to operate, and the diversity of interests involved, many of these problems are simply unavoidable and will need to be addressed.

Difficult as it is, the logic of staying within the boundaries of an NDC or a trajectory to net zero means that neither can all activities can be credited, nor can every of improvement of historic or projected emissions or removals.

Host countries have nationally determined contributions, and will be contributing to international goals at different paces which necessarily suggests a degree of difference in approach and priority. Reflecting and managing this diversity is a challenge and arguably a centralised mechanism may be best placed to do so.

The approach to development and approval of existing methodologies is not perfect and took time to develop. What we did have under the CDM was a system of methodology development based on expert judgement and assessment of inputs from private sector actors. They too involve judgements and data is not always available. Judgements that were not always transparent when contested. We need to design a system that is better and focused on the future rather than the past.

The implementation and application of new responsibilities and processes will take time and will require capacity support (cp. also 'Ensuring inclusiveness' elsewhere in this issue). The implementation of high-performance benchmarks will also take time, involve technical and economic judgements, and will require transparent and open governance processes to engage trust and credibility. Time is short.

Conclusion

In summary, arguably we have delayed addressing these significant challenges, debating in far more depth and detail the recognition of the legacy of the Kyoto Protocol rather than focusing on the challenges of the immediate future. There is limited time for Article 6 in general, and Article 6.4 in particular, to adapt to the challenges of Paris Agreement. All the more reason to set a direction and start the hard work of implementation now.



Source: Kuczynski / unsplash

Staying on track: negotiators need to find a balanced approach that meets the full range of challenges imposed by the Paris Agreement.

Ambition Coefficients

Aligning baselines for international carbon markets with net zero pathways

by Axel Michaelowa (University of Zurich and Perspectives), Lukas Hermwille (Wuppertal Institut), Aglaja Espelage (Perspectives) and Katharina Michaelowa (University of Zurich)

Global greenhouse gas (GHG) emissions have continued to increase over the last two decades despite all international and national attempts to mitigate climate change. The challenge has increased in the last years due to the shift from the top-down approach of the Kyoto Protocol to the bottom-up approach of the Paris Agreement (PA) where all countries pledge mitigation. However, the Nationally Determined Contributions (NDCs) are specified in many different ways, and for many countries are not really ambitious. According to UN Environment (2020) the projected emissions gap between NDCs and 1.5-2°C compatible emissions paths in 2030 has increased over the last 10 years. Thus, the time remaining shrinks to shift the emissions path downwards to achieve a balance of GHG emissions and sinks globally between 2050 and 2070, as seen as necessary by IPCC (2018) in order to respect the 1.5°C target of the PA.

International carbon markets have been hotly contested over the last decade. Negotiations about the detailed rules for carbon markets under Article 6 of the PA have been protracted, with COP26 being already the third attempt to achieve an agreement. While some parties and stakeholders call for international carbon markets to at least contribute to an ambition increase of NDCs over time (Howard et al. 2017), others continue to see carbon markets primarily as a tool to lower compliance costs and enhance flexibility in the achievement of NDCs.

When looking at different forms of international carbon markets, many observers see no long-term future for baseline and credit mechanisms. As their name says, these mechanisms generate emissions credits by comparing emissions after the implementation of a GHG mitigation activity to emissions under a counterfactual, the so-called baseline. The baseline is determined by applying a baseline methodology. A stringent baseline leads to few, or zero emissions credits being allocated to a mitigation activity while a lenient one will allocate many credits. If we want to achieve a high level of environmental integrity, the baseline should be stringent.

Why emissions intensity baselines do not ensure emissions decreases

Baselines for international crediting mechanisms, for example the Clean Development Mechanism (CDM) have to date been specified in form of greenhouse gas emissions intensity factors and linked to business-as-usual (BAU) developments. This means that baselines have been denominated as GHG emissions per unit of production of a good or service. Therefore, absolute emissions can still increase if the production of the goods and services increases and the rate of production increase exceeds the rate of GHG intensity reduction. Thus, with increasing production of goods and services through carbon market activ-



Into the future: baselines must be more stringent than BAU and take account of the Paris Agreement's long-term goal.

ities, absolute emissions may increase or fall only slowly. But under the Paris Agreement we need an absolute, rapid decrease of emissions regardless of production levels. Do we thus have to abandon the concept of intensity-based baselines for the international carbon markets under Article 6?

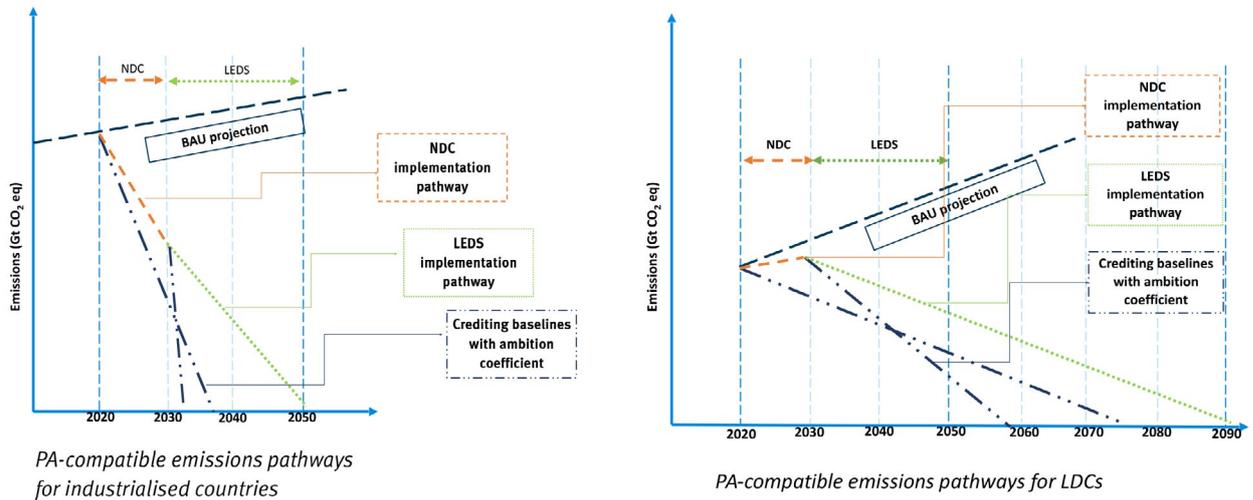
Paris-proofing the 'methodology capital' through dynamic elements

Consigning to the dustbin the over 250 CDM baseline methodologies approved over the last 15 years for a wide range of mitigation technologies would be an irresponsible waste of resources (cp. 'Ensuring ambitious baselines' elsewhere in this issue). Developing methodologies from scratch would

also mean that Article 6 carbon markets would be blocked for several years, which would lead to a loss of mitigation opportunities as well as of the human capacity indispensable for operation of the markets.

During the Article 6 negotiations, on the technical level, the scepticism regarding the consistency of baseline-and-credit systems with the PA architecture has prompted many governments to call for baselines that are set below, i.e., more stringent than BAU and consider the long-term target of the PA. Through this, the market mechanisms would contribute to the transformational change needed to shift emissions to pathways that are in line with net zero targets. This means an approach needs to be found that generates a dynamic baseline where the baseline emission intensity would gradually and in a predetermined way move

Figure 1: Different net zero pathways consistent with common but differentiated responsibility



Source: authors

downwards from the BAU intensity towards a normative/policy reference (Hermwille 2020). In the Article 6 negotiations, the EU has been calling for baselines to be determined by the best available technology, but even such an approach nor a baseline linked to NDC and LEDS emissions pathways does not guarantee that emissions fall sufficiently quickly. The baseline must be more stringent (for a detailed account of the EU position, cp. 'Taking a long-term perspective' elsewhere in this issue).

The ambition coefficient for the emissions intensity applied in the baseline

We now discuss how a transition parameter can be defined that reduces uncertainty for potential private investors and is predictable over long periods. In order to allow continued use of emissions intensity baselines while being in line with the ambition of the PA, we propose to apply an 'ambition coefficient' to emissions intensities

of BAU technologies. This coefficient decreases to reflect increasing ambition over time, and reaches zero when a country needs to reach net zero emissions. It allows alignment of carbon markets with net zero pathways and ensures that carbon markets will not lead to a lock-in of emissions. The ambition coefficient's value would start at 100% of BAU and reach 0% at the date of net zero emissions.

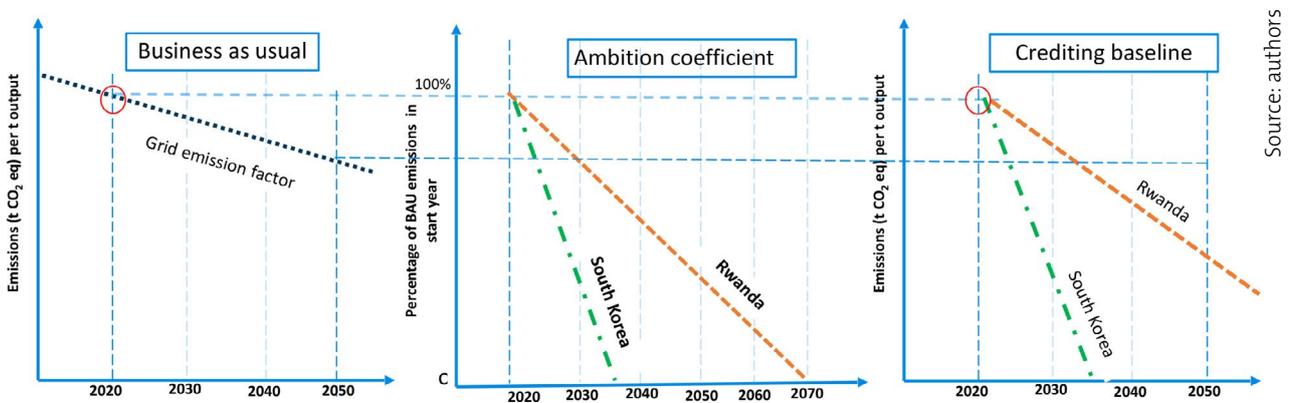
Due to the principle of common but differentiated responsibilities and respective capabilities, the coefficient would fall more quickly for rich than for poor countries. The latter would still be able to generate emission reduction credits well beyond 2050, while for the former the baseline would reach zero around 2035, and thus emissions credit generation would be limited to removals from that point in time onwards. This differentiation would also be in line with the concept of 'suppressed demand' for goods and services in poorer countries which vanishes as countries develop.

Case study: ambition coefficients for South Korea and Rwanda

The conceptual application of the ambition coefficient is shown in Figure 2 for two countries, a high-income one and a low-income one, here exemplified by South Korea

and Rwanda. The BAU emissions intensity as calculated in the CDM baseline methodologies will be multiplied by the ambition coefficient which declines over time. The required decline will be more rapid for South Korea than Rwanda.

Figure 2: Application of the ambition coefficient to the BAU to derive a dynamic crediting baseline in a case study



Source: authors

We now undertake the calculation of baseline emissions for projects producing electricity for the grid/saving electricity that want to generate emissions credits in South Korea, and similar projects in Rwanda, respectively. We assume that the projects start in 2020 and have a crediting period of 15 years until 2035.

As a first step, we take the average grid emissions factor calculated as per the baseline methodology applicable under the CDM, using the 'Tool to calculate the emission factor for an electricity system', from the database published by the Institute of Global Environmental Strategies (2021): 626 g CO₂/kWh for South Korea and 654 g CO₂/kWh for Rwanda.

As second step, we apply a country-specific ambition coefficient for each emission reduction vintage year. Here we apply our own assumptions. For South Korea as an OECD member, responsibility is high as acknowledged by the

government when declaring a net zero target for 2050. We thus set 2040 as the year in which the ambition coefficient reaches zero. For Rwanda as a least developed country (LDC), responsibility is low and therefore 2070 is set as the date when the ambition coefficient attains zero.

Applying these values to calculate the ambition coefficient, it reaches 75% in 2025, 50% in 2030 and 25% in 2035 for the case of South Korea, while it reaches 90% in 2025, 80% in 2030 and 70% in 2035 for Rwanda. The resulting baseline emission factors are shown in Table 1.

The outcome would be that an activity in Rwanda would generate significantly more credits from the late 2020s onward compared to South Korea.

Table 1: Baseline emissions factors (g CO₂/kWh) for grid electricity-related activities in South Korea and Rwanda

Country	2030	2025	2030	2035
Rwanda	654	589	523	458
South Korea	626	470	313	157
Difference (%)	5%	20%	40%	66%

NDCs and Long-term low emission development strategies (LT-LEDS) could be a starting point, but as noted above their ambition is often lacking. We therefore suggest building on exercises like Holz et al. (2018) or van der Berg et al. (2020), where large teams of researchers from around the world try to calculate fair emissions pathways. Appropriate indicators for such calculations should take into account both the country's capacity and its responsibility for the current level of emissions. They could thus include gross national income (GNI)/capita, cumulated historical emissions, mitigation potential and geographic criteria.

We would like to note that this approach does not require agreement under the UNFCCC on a 'fair' distribution of the burden of mitigation action, which is unlikely. It will thus simply limit the possibility to benefit from participation in international carbon markets to those countries showing a sufficiently high level of actual emission reductions. The increasingly stringent baselines imply that a larger share of the mitigation remains in the host countries thereby facilitating them to raise ambition in their NDCs and protecting the PA from perverse incentives for governments to keep mitigation action low to increase revenues from carbon markets.

Governing and administering the ambition coefficients can in principle be undertaken by UNFCCC entities like the support structure of the Article 6.4 SB. This would mirror the calculation of standardised baselines by the regional cooperation centres (RCCs) of the UNFCCC Secretariat, which has frequently been undertaken in the latter years of the CDM. Before the Article 6.4 infrastructure is in place, buyer country clubs like the supporters of the San José Principles could apply ambition coefficients jointly for their purchases. Sweden, for instance, already intends to apply more stringent baseline methodologies for their Article 6 pilots (Michaelowa et al. 2020).

Bridging the negotiations gap through the ambition coefficient

The ambition coefficient offers a solution to address the revision needs of approved CDM methodologies that are found to be incompatible with the PA principles of reference levels below BAU, contributing to NDC implementation and being aligned with PA long-term objectives (for a discussion, see Michaelowa et al. 2020). The ambition coefficient can thereby reconcile positions in the current discussion on transition of elements from the CDM: it preserves the body of knowledge on quantifying and calculating emissions and associated reductions, while aligning the reference levels with PA-compatible pathways. A tedious case-by-case revision of methodologies with justification for chosen parameters could be avoided.

Carbon market actors and investors may see this proposal as creating barriers to the upscaling of carbon markets and a deterrent for the mobilization of private finance. Yet, it ensures that at least some trade can still happen. Investors may prefer a stringent but transparent system of dynamic baselines to a future with ad-hoc changes to bring carbon markets in line with global mitigation targets. This is what prior experience suggests when private actors preferred conservative defaults under the CDM to values that were costlier to monitor. The ambition coefficient valid for the relevant crediting period of the activity should be fixed ex ante until the end of the current NDC cycle (5 years). The ambition coefficient should then be updated with every new NDC cycle in the light of the results of the most recent global stocktake. By doing so, one could take into account whether countries are actually in line with the net zero pathways. Only such a dynamic baseline approach will ensure a continued role for international carbon markets for several decades as it generates trust that the markets will operate in line with the long-term ambition of the international climate policy regime.

A key benefit of the ambition coefficient approach compared to baseline methodologies linked to NDC targets is

that there is no potential for gaming by the host country, i.e. to adopt less stringent targets to maximize carbon credit revenue. If a country deviates from a PA-compatible emissions trajectory, and at its next NDC update this deviation becomes apparent – no matter whether this is because its NDC itself lacks sufficient ambition or because the country does not comply with its NDC – it will face the disadvantage of being excluded from the opportunity to supply credits on the international carbon market. This is because, when the deviation becomes apparent during the country's next NDC update, its ambition coefficient will now go down even more quickly than in the past, and the date at which it reaches zero (or the relevant negative endpoint) is accelerated. One would thus even expect that entities wanting to sell emission credits will put pressure on the government to increase the ambition of the NDC update. The ambition coefficient concept is thus an incentive compatible with a continuous ambition increase. At the same time, the ambition coefficient baseline does not interfere with the NDC and thus respects each country's sovereignty.

The ambition coefficient approach can serve as a 'bridging proposal' for the operationalization of PA carbon markets resolving the negotiation gridlock between those who want to increase stringency in carbon market instruments and those who think mitigation ambition should be generated through more stringent NDCs, facilitated by cost savings and increased financial resources generated by carbon markets. It also allows to align the existing body of methodologies with the necessary ambition levels to implement the PA, keeping transaction costs low.

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Opinion

Ensuring inclusiveness

New types of capacity building required for a balanced structure in Article 6 markets

by Thomas Forth, Advisor to BMU

Recently, during the SB June Session and in many of the Informal Technical Experts Dialogues, developing country representatives highlighted the need for capacity building as conditional for host countries to participate in mitigation activities under Article 6. However, capacity building is not among the meaningful and controversial topics left over from COP25 in Madrid. This means that capacity building will not be addressed in a separate session ahead of Glasgow. Even so, the report by Minister Grace Fu (Singapore) and Minister Sveinung Rotevatn (Norway) on the Informal Ministerial Consultations on Article 6 of the Paris Agreement on 7 and 12 July, convened in London by the UK COP Presidency, mentioned capacity-building for developing countries to ensure broad and inclusive participation. There are strong reasons for adding this topic to the agenda in 2022.

Historical experience may serve as an explanation for that proposal. The regional distribution of CDM activities has led to a dominance of early movers like Brazil, China, and India. At that time, some said it was the normal effect of markets and is what the CDM is all about. It took years before many more developing countries managed to attract CDM projects, and the situation was even worse for some countries in that it was too late for them to benefit from the CDM boom in the first commitment period in 2008-2012 (CP1).

With the lack of ambition during the second commitment period (2013-2020) and the late entry

into force of the Doha Amendment at the end of that period in 2020, demand and prices collapsed to a large extent. During this phase we saw the overhang years 2013-2015, where a bulk of already prepared CDM activities were registered, followed by years of only a handful of project activities. The lack of ambition in the last decade has brought the number of CDM activities down, while the JI ended immediately with CP1. While this isn't new information, we should be aware that the capacity for performing carbon market projects under the UNFCCC has decreased dramatically. The start of Article 6 will not be so easy that we can assume we only need to address a few new conditions and in practice flip some switches and set to work.

Hopefully, Parties will not question the fact that the historical experiences with the start of the CDM should not be repeated – waiting for the self-revitalization of the carbon market is wrong. If Article 6 is to be one of the mechanisms to contribute to the ambition raising architecture of the Paris Agreement, then capacity building is the condition on which to achieve inclusivity and the way in which cooperative approaches should be designed. There is a political purpose in shaping the carbon market, but not the other way around.



Source: Solar Schools by R. Foster, Winrock / USAID (<https://flic.kr/p/9RgYtD>) / Flickr / US Government Works License (<https://www.usa.gov/government-works>)

Defining the needs: capacity building should become more substantial.

Allowing early participation

What needs to be done now? What types of capacity building are needed, what is the process to define them and what about the financial resources? Who benefits and who should pay?

What could be heard from the statements from many developing countries at the above-mentioned virtual sessions was that future capacity building measures should make a difference compared with earlier times, where capacity building was more on the knowledge side, with technical tools and promotional aspects for project matching and mobilization. All of these activities will remain useful. But what could also be taken from the statements of developing countries is that capacity building should be become more

substantial. The focus of measures should be more “hands-on” and support the host country in finding the balance between NDC compliance and potential benefits under Article 6. This stringent conclusion might be my interpretation, but I think the developing countries’ statements go unambiguously in the same direction.

That this topic arises so strongly after almost six years of reflections on the meaning and the technical details of Article 6 should be seen as a good sign, that the time is ripe for COP decisions in Glasgow. However, and once more, capacity building is not at the centre of the crucial and meaningful topics which Parties called the “leftovers” from Madrid. It would be helpful if the topic finds its way onto the agenda next year. But this year, a CMP decision on the CDM reserve possibly linked

to the early start of the Article 6.4 mechanism could mobilize the financial resources needed for capacity building at a time when the share of proceeds from new project activities will only come with implementation later down the line. As we know, the immediate use of the CDM reserve for Article 6.4 is subject to political controversies as part of the Article 6 rule book complex. Without a CMP decision of this kind, financial resources are limited to programmes of early moving Parties, which in most cases are bilaterally, not globally inclusive.

Bearing these limitations in mind, we should use the time to reflect on how a progressive understanding of capacity building measures could lead to appropriate programmes on global level under the UNFCCC and at the level of Parties or actors participating in cooperative approaches, meaning transferring and acquiring Parties and actors. This clearly means that host countries should not be left alone with complex issues arising from guidelines on Article 6.2, the RMPs for Article 6.4 and the programme design for Article 6.8 under the work programme. Acquiring Parties and other actors could not expect that interested host countries undertake this work alone and in advance. It is also questionable whether advanced developing countries or those already with carbon market experience find themselves in a good position to move forward.

However, as already mentioned, the transferring side will also be seen as contributor. It is evident that this results from the higher role of host countries in the determination and implementation of cooperative mitigation activities. When cooperative approaches contribute to the climate goals and sustainable development of the host country, all costs and benefits of the participants must be considered. My expectation is that carbon pricing under Article 6 will lead to a price level which is not comparable to that under the CDM. The reasons why prices are being driven higher are simple: transparent carbon prices in emission

trading systems, shadow carbon pricing in companies and economic assessments of opportunity costs for the host country. If these can occur, then other types of activities could be achieved with Article 6.

Overview of capacity building activities

What is needed on the host country side, what should be delivered by the international community and how can benefitting actors contribute?

Tables 1-3 (see next page) give a simply-structured overview of potential capacity building measures.

Short reflections on ...

... the host country

The shift from project-based approach to up-scaled programmes requires support for the host country in new types of capacity building activities, including the national climate policy strategy, with progression over time in upgraded NDCs, the transformation of sectors and sub-sectors to lowest emission levels, the strategy for sharing mitigation outcomes in the longer run, limited by global and national climate neutrality targets, and the deliveries on the requirements resulting from UNFCCC decisions related to Article 6. The paradigm shift from the flexibility concept of the Kyoto Mechanisms to the ambition raising concept of Article 6 influences the types of capacity building for the host country, but not for the host party alone.

... international activity participants

It is important to understand that international participants in Article 6 activities cannot be involved in domestic climate policy development and the cooperation strategy. Therefore, a decoupling of the development of the domestic

Table 1: Capacity Building — UNFCCC Rules

Topic	Description	Financing	Comment
Decisions on Article 6.2/6.4/6.8	Information and training, interactive knowledge hub	International financing by Parties	Regularly updated with new decisions
Mandated work	Information, exchange, and participation when possible	International financing by Parties	Exchange and participation should be defined in the mandates
Open processes for further decisions, until now: Article 6.8 work programme	Structured dialogues, fora for the exchange of experiences	Not only international financing, where possible mobilizing other resources depending on the involved actors	Controversial topic, results of work program needed first, but the process needs until that moment even need finance
Reflecting the role of host countries	Fora for the exchange of experiences in mitigation activities	International financing by Parties	Comparable to the DNA forum, but expanded set of items

Table 2: Capacity Building – NDC - Article 6 complex

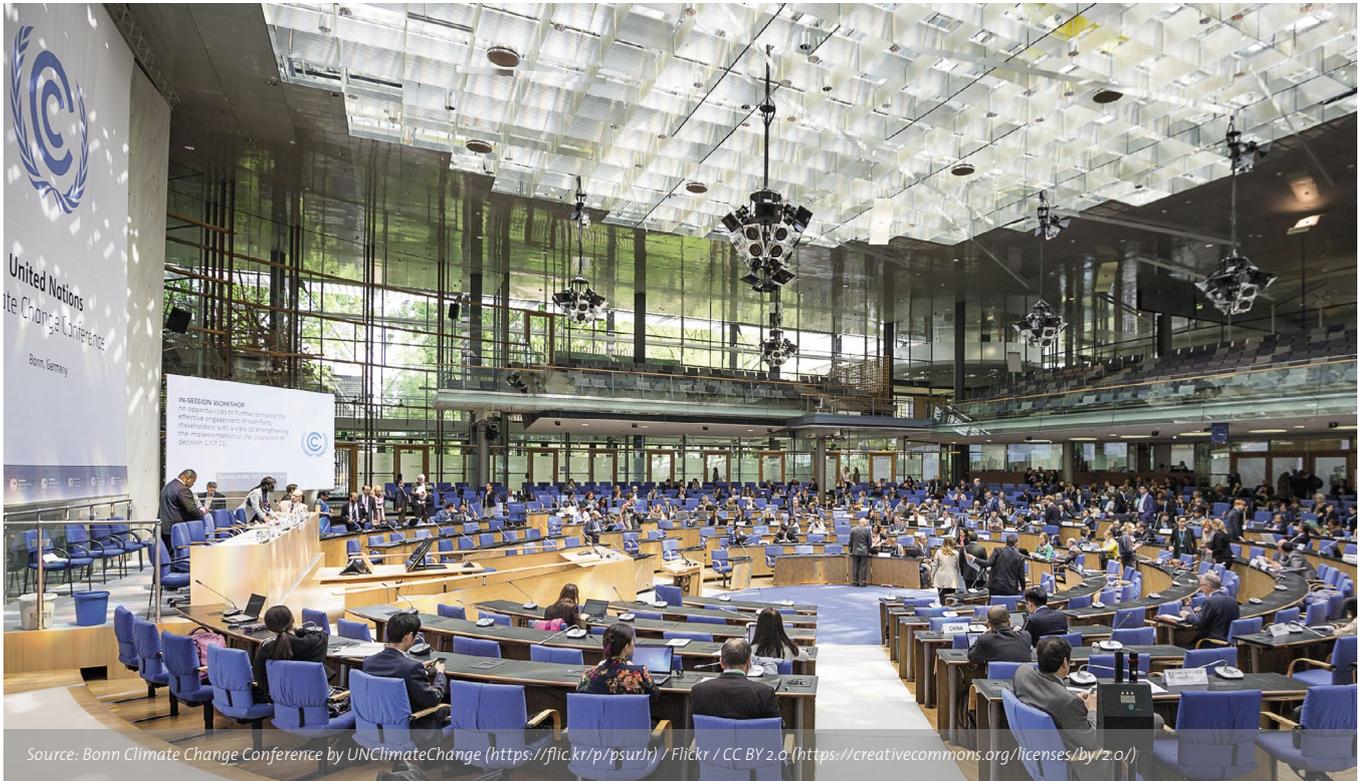
Topic	Description	Financing	Comment
Domestic NDCs	Describing what the NDC is delivering domestically, in actual terms and on progression over time	<ul style="list-style-type: none"> • Host country • Climate finance on NDC development 	<ul style="list-style-type: none"> • Quantification • What are quantifiable parameters • Transformational change
NDC-A6 gateway	<ul style="list-style-type: none"> • Clarifying the entry points for international cooperation • Ensuring supplemental mitigation activities 	Specific A6 capacity building programme	<ul style="list-style-type: none"> • Building on existing data from the NDC complex and • New data retrieved for applying ambitious baselines
Exploring the areas for providing mitigation outcomes for offsetting	<ul style="list-style-type: none"> • Building on what the LTS already foresees • How the host country could guide transformational change with use of Article 6 • How the carbon neutrality goal influences the emissions budget and the threshold for ITMOs 	<ul style="list-style-type: none"> • Host country • Climate finance NDC development • Specific A6 CB financing 	<ul style="list-style-type: none"> • Getting the perspective and the space for A6 right for the ongoing NDC period • Fields of cooperation should also be defined in the long run with the decreasing opportunities for delivering emission reductions for international offsetting
Overlaps and synergies with other domestic strategies	<ul style="list-style-type: none"> • Coordination and harmonization of concerted mitigation activities • e.g., SDGs, technology transfer, climate finance 	<ul style="list-style-type: none"> • Host country • International capacity building programme 	<ul style="list-style-type: none"> • Institutional capacity building for this permanent issue • Fully integrated in administration • A national support centre should be tasked with providing expertise for coordination by the administration

Topic	Description	Financing	Comment
Preparing and applying of mitigation activities	<p>Key features of Article 6:</p> <ul style="list-style-type: none"> • Additionality clarifications • Ambitious baselines appropriate to applications • Standardizing baselines for expanding domestic policies and measures • Developing programmatic and sectoral frameworks for investments • Reporting and reviewing 	<ul style="list-style-type: none"> • Host country • Climate finance on NDC development 	<ul style="list-style-type: none"> • A national support center should be established and skilled with “hands-on” capacity measures • Establishing a registration procedure for transparency reasons to avoid overlapping activities and provide an opportunity for synergies • Keep tracking mitigation activities and provide information to apply corresponding adjustments • Preparing reports and supporting review processes
Carbon pricing	<ul style="list-style-type: none"> • Pricing procedure and price level • In conjunction with a fair sharing of mitigation outcomes 	<ul style="list-style-type: none"> • Host country • International capacity building programme 	<ul style="list-style-type: none"> • Analyzing opportunity cost for the host country • Analyzing the substantial contribution of project participants as a basis for (IT) MO sharing • Introduction of fees for registered activities with the intention to refinance the public costs
Investment strategy of the host country Public private dialogues within the host country	<ul style="list-style-type: none"> • Strategy building for active use of cooperative approaches • Avoiding single project approaches, bringing all investments into a broader scheme • Preparing for unilateral mitigation activities and ITMO market 	<ul style="list-style-type: none"> • Domestic financing • Including fees from successfully implemented mitigation activities for ITMO transfer 	<ul style="list-style-type: none"> • Based on all domestic actors in the strategically pre-defined areas for using Article 6 • Openness for inviting international partners for technology transfer and/or longstanding business corporation
Institution building on government level	<p>Technical supports the constant workability in the responsible ministry and for inter-ministerial coordination</p>	<p>International financing in the start phase and growing domestic finance generated by activity fees</p>	<ul style="list-style-type: none"> • Establishing a domestic support center • broadening the domestic staff

framework for bilateral and multilateral cooperation under Article 6 on the one hand and the concrete cooperative mitigation activities on the other have an impact on the mobilization of resources for capacity building. However, it could be expected that host countries will decide on cost sharing in their preparatory work on Article 6 readiness regarding the framework and grounds for investment.

... carbon pricing

On the partner side, rising costs are never welcomed, but the pricing level must be assessed against the carbon pricing level in the home base of the company or the acquiring Party. We will see a different pricing level compared to the CDM. From a political standpoint, this a logical consequence if Article 6 is really to deliver on upscaling and ambition raising. To prevent misunderstand-



Dialogue and exchange: further dialogue and elaboration on the spectrum of capacity building measures are needed.

ings, this is not an argument against projects which are additional but have relatively low generating costs. It makes sense to harvest these emission reduction potentials quickly and to tap into an emission reduction potential with higher cost-avoidance later on.

Of course, carbon pricing levels are an important source of information for decision making on the buyer side, while other aspects depend on the buyer's interest and business operation capacity. Demand for a broader spectrum of activities should be expected. Admittedly, for the time being demand is low and non-transparent. My take from this unfortunate situation is that as long as negotiators are not forging ahead with the rule book, demand will remain low and as long as capacity building is delayed, supply remains similar to that seen with the CDM. Parties from

the transferring and the acquiring sides with an interest in using Article 6 in the near future should request global capacity building assistance, while at the same time engagement using their own resources should be balanced between participants to enable more engagement in the capacity building of host countries and the supply of various mitigation activities in line with their development needs in meeting the global climate objective. This again brings up the question of the CDM reserve, but with a subsequent question: how much and at what time should the acquiring side contribute to these capacity building measures in addition to resources taken from the CDM reserve?

In financing capacity building, we should differ from the need to initiate these activities for a limited period and for the subsequent period when

Article 6 works as a fully established cooperation mechanism with public and private entities on both sides. Having once achieved this stage, the mechanism should again be the cost of its operational success.

Next steps

The broad spectrum of capacity building measures and the “hands-on” character is a pre-condition for the start of Article 6 activity at scale and in the role foreseen in the Paris Agreement. With substantial decisions on mechanisms and transparency in Glasgow, the content of capacity building becomes clearer and reliable – follow-up decisions mandated by the CMA and performance regulation prescribed by the Supervisory Body will feed that content over time.

Dialogues and exchange

For those who want room for further dialogues and elaboration on the spectrum of capacity building measures, it would be preferable to have the opportunity to come together in official meetings in the run up to COP27. Exchange of this type would have two goals: firstly, to achieve common ground on the general catalogue of measures, which could be implemented under the authority of UNFCCC secretariat with many other entities and partners, and secondly, that host countries will determine their concrete capacity building needs; perhaps this is the key gain from the exchanges and meetings.

Programming and mobilization of resources

Finally, we need decisions on the capacity building programme and its financing. The programme cannot define the content but only the types and the nature of eligible measures and the financing arrangements for each type. From whom and to what extent contributions and payments might be appropriate should be a topic for official meetings. It makes a difference if capacity building measures inform and shape the relevant UNFCCC regulation and the entire process or if they go substantially further in the form of hands-on support for concrete mitigation activities. To a great extent, operation of the Article 6 mechanism should become self-financing. However, for the start of Article 6 activities, the CDM reserve could play a key role but could not be the only source of finance for capacity building. Additional finance should be provided by the acquiring Parties engaging in international ambition raising. This should be reflected in the budget decision in Glasgow.

A Flightpath for Climate Friendly Aviation?

Europe starts to shift its focus away from carbon markets to regulate airlines

by Aki Kachi, NewClimate Institute

Last year, the EU – on its way to climate neutrality by 2050 – ratcheted up the ambition of its NDC from at least 40% to at least 55% by 2030 from 1990 levels. This summer, the European Commission presented the “Fit for 55” package of proposals on how to reach the ratcheted goal. The package is significant, wide-reaching, and suggests a shift in Brussels’s thinking about how to

regulate greenhouse gas emissions from aviation. A jump in ambition in some respects, the package potentially represents backsliding in others, but will nevertheless require further measures and fine tuning in order to get European and global aviation on track to reach the Paris Agreement goals.



Source: Authors based on Perspectives Climate Group and SEA (2021).

Dawn of a new era? The EU’s “Fit for 55” package is wide-reaching and significant.

When it comes to addressing aviation's climate impact, carbon pricing and carbon markets have long been Europe's focus. Frustrated by ICAO's slower than a snail's pace progress following the 1997 Kyoto Protocol, the EU moved to expand the scope of the EU ETS to cover flights to, from, and between countries in the European Economic Area (EEA) in 2012. The political response from the US, Russia, China and others was swift; and the EU moved to defuse tensions by temporarily "stopping the clock" on in- and out-bound aviation in the EU ETS.

This was likely an important factor in the next round of ICAO negotiations, which yielded some limited progress in setting the unambitious goal of climate neutral growth (CNG) from 2020 levels at the ICAO Assembly in 2013. Despite Parties meeting in Paris in 2015 agreeing to limit global warming to well under 2 °C and to pursue effort for 1.5 °C, ICAO's "critically insufficient" CNG2020 target was not revisited and continued to set the agenda and became the basis for the 2016 ICAO agreement of the Carbon Offsetting Scheme for International Aviation (CORSIA). Fast forward to 2021, the beginning of CORSIA's first pilot phase and it is time for Europe to make a decision on how CORSIA and the EU ETS should co-exist, and what role they should play in Europe's climate efforts.

In the matter of carbon pricing and carbon markets, the Commission proposes that the EU move to implement CORSIA through changes in the EU ETS Directive. This would be done by maintaining the "full scope" of the EU ETS, but carving out a number of exceptions to accommodate CORSIA. According to the proposal, all airlines would have to use EU ETS allowances to cover compliance

obligations associated with flights between EEA member states, and for flights from the EEA to both the UK and Switzerland.¹ For flights between the EEA and non-European countries participating in CORSIA, European airlines would use international units approved by ICAO with the further stipulation that these units must come from countries that are: Party to the Paris Agreement; participate in CORSIA; and promise to account for unit transfers to avoid double counting. Non-European airlines based in countries participating in CORSIA are exempt from the EU ETS for flights to and from the EEA, as it is assumed that they will comply through their own country's regulatory regime. Flights between the EEA and countries not participating in CORSIA are entirely exempt and will not be covered by anything until at least 2027.

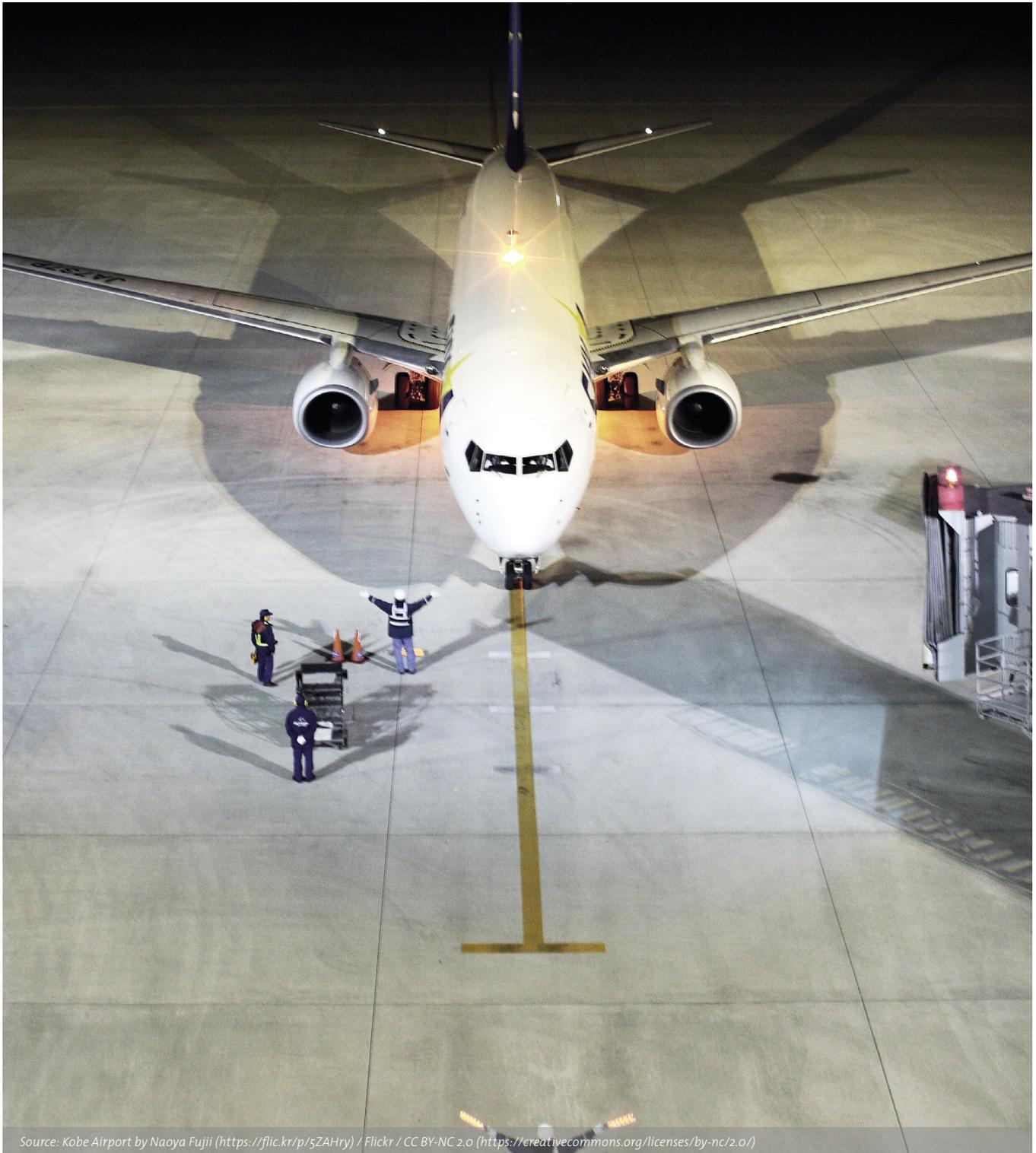
This last category of flights not covered by any carbon market obligation notably includes many of what, until the outbreak of COVID-19, were the world's fastest growing aviation markets: China, Brazil, India, and South Africa, among others. This effectively leaves incoming and outgoing flights outside the scope of Europe's carbon pricing efforts, and a large number of flights completely uncovered by any regime at least until 2027 which suggests a backsliding of ambition from the EU's 2020 target,² in which Europe confirmed to cover outgoing flights, though the scope of 2030 aviation coverage in Europe's NDCs was left rather more vague.

Assessing the EU package

This proposal is not the most ambitious of the options that the Commission modelled. The Commission's impact assessment found that "full scope" ETS with EUAs covering incoming and outgoing

1 Parallel agreements foresee that flights from the UK and Switzerland to the EEA will be covered by those countries' respective emissions trading systems.

2 European Commission (2019). EU Fourth Biennial Report under the UNFCCC. https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/045612387_European%20Union-BR4-1-European%20Union-BR4_C_2019_8832_and_SWD_2019_432.pdf, page 34.



Source: Kobe Airport by Naoya Fujii (<https://flic.kr/p/5ZAHry>) / Flickr / CC BY-NC 2.0 (<https://creativecommons.org/licenses/by-nc/2.0/>)

Fine-tuning needed: the EU Commission's proposals could do with further strengthening.

flights (instead of CORSIA) would have the largest global mitigation impact in 2030 both in terms of gross direct emissions - as well as on a net basis. Both CORSIA and “full scope” EU ETS are expected to have a net impact outside of the aviation sector: CORSIA is expected to have an impact in the sectors where offset projects are developed; and the EU ETS is expected to have an even bigger impact through the additional demand for allowances generated by aviation which drives mitigation in other sectors covered by the system. These “net basis” calculations are likely to be overly rosy with regard to CORSIA’s climate benefit for a number of reasons.

First, ICAO’s Technical Advisory Body (TAB) found that none of the various offset programmes applying for CORSIA eligibility fulfilled all the required “Emission Unit Criteria” (EUC), and were heterogeneous in how they met many of them, notably with regard to sustainable development safeguards, double counting, additionality, baselines, and quantification and MRV. The Commission further notes that ICAO’s TAB only looked into this if the applicant offsetting programmes had measures to address the criteria, rather than looking to see if the measures were effective in fulfilling the criteria. Second, it is unclear what offset programmes ICAO may approve in the future. Third, the Commission’s assessment raises doubts with regard to uniform implementation of CORSIA, especially considering the lack of transparency as little information is automatically made public.

Another notable gap is that ICAO has no measures to enforce compliance on either countries or airlines. This represents a large divergence from the ambition level of the Paris Agreement, the

EU’s previous international climate pledges, and notably goes in the opposite direction from the Commission’s proposals to include a portion of international shipping emissions in the EU ETS.

The lack of climate ambition for flights to and from the EEA also stands in stark contrast to the Commission’s proposed measures for aviation within the EEA. First and foremost, instead of the constant EU ETS cap that was in effect until 2021 (and a slightly strengthened linear reduction factor thereafter), the Commission proposes that aviation should be covered under the new steeper linear reduction factor of 4.2% from 2024. The free allowances that aviation receives will be progressively phased out by 2027. Despite that, the Commission finds that the EU ETS still only “partially internalize[s] climate externalities”. This is part of the justification to propose a tax on aviation fuels – though this would be phased in over a long period of ten years. This brings the EU in line with international norms considering that many other countries have domestic aviation fuel taxes of various levels including the United States, Canada, Australia, Japan, Thailand, and Vietnam – the EU was a notable exception. Sustainable alternative fuels and electricity are exempt from the tax for the first ten years.

This domestic aviation fuel tax and corresponding fuel tax exemption for alternative fuels will likely have a bigger impact in conjunction with the third important measure for aviation in the “Fit for 55” package: a blending mandate for “sustainable alternative fuels” including a sub-quota for synthetic e-fuels. Synthetic e-fuels have the potential to be the “high hanging fruit” among aviation’s mitigation opportunities. When the electricity used to make them is renewable, and the carbon is pulled

3 European Commission (2019). EU Fourth Biennial Report under the UNFCCC. https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/045612387_European%20Union-BR4-1-European%20Union-BR4_C_2019_8832_and_SWD_2019_432.pdf, page 34.



Source: Solar Impulse flying over the pyramids, Egypt by Solar Impulse (<https://flic.kr/p/K5PSDP>) / Flickr / CC BY-NC ND (<https://www.creativecommons.org/licenses/by-nc-nd/2.0/>)

Powered by nature: the solar impulse is a long-range experimental solar-powered aircraft, which in July 2016 completed the first circumnavigation of the Earth by a piloted fixed-wing aircraft using only solar power.

out of the air, they can reduce CO₂ emissions by 100%. Synthetic e-fuels also have advantages in that they can reduce the non-CO₂ climate impact of aviation, though not eliminate them – an issue that is otherwise a glaring gap in both the EU and ICAO policy measures. Given that the cost of these fuels are around 3-11 times higher than current jet fuel prices,³ the current carbon prices

of around EUR 5 per tonne for CORSIA eligible carbon credits,^{4,5} or EUR 62 for EU ETS allowances,⁶ are not a sufficient incentive for either airlines to buy such fuels, or for potential fuel producers to enter the market. The proposed blending mandate, in conjunction with a prohibition on tankering (carrying extra fuel to avoid refueling at every airport), start to provide this incentive.

4 Watson (2021). INTERVIEW: Voluntary carbon market looks to COP26 for clarity, growth: Gold Standard. S&P Global Platts. 8 September 2021. <https://www.spglobal.com/platts/en/maket-insights/topics/cop26-un-climate-change-conference>

5 Prices for CORSIA eligible units in the EU are likely to diverge somewhat from this considering the additional EU criteria for EU airlines.

6 Krukowska (2021). German Utility Calls for Limits on EU Carbon Market Speculators. Bloomberg. <https://www.bloomberg.com/news/articles/2021-09-08/german-utility-calls-for-limits-on-eu-carbon-market-speculators>

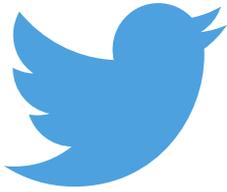
The blending mandate is placed on fuel suppliers in Europe rather than airlines themselves and would therefore also provide a climate benefit for outgoing flights. Here important caveats should be highlighted in that, although first generation biofuels are not supported, the climate impacts of later generation biofuels in particular, the sustainability and availability of feedstocks still means that their climate benefit varies widely. Here, stricter sustainability rules for alternative fuels would strengthen the measure, including with regard to the sources of the electricity and carbon for e-fuels. Similar blending mandates and higher sustainability standards should be promoted through outreach in ICAO and partner countries.

Conclusion

In sum, the “Fit for 55” package has a number of moving pieces which respond to the uncertainties and weaknesses around CORSIA, ICAO, and the policy processes in other countries. In some ways it represents a marked progression in ambition – in particular for the direction of travel for aviation within Europe. In others, the proposal could still use further strengthening. Further negotiations with the Council and Parliament over the coming months and perhaps years may still improve or undermine key parts of the proposal. But for now, Europe has a clear basis for discussion that moves the conversation around policy measures to address the climate impacts of aviation away from a purely carbon market approach and towards one that includes other options to incentivize and scale up longer term solutions.

Relevant EU proposal documents can be found here:

- Revision of the EU ETS For aviation: https://ec.europa.eu/info/files/revision-eu-emission-trading-system-aviation_en
- Revision of the EU ETS: https://ec.europa.eu/info/files/revision-eu-emission-trading-system_en
- Notification on the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA): https://ec.europa.eu/info/files/notification-carbon-offsetting-and-reduction-scheme-international-aviation-corsia_en
- Revision of the Energy Tax Directive: https://ec.europa.eu/info/files/revision-energy-tax-directive_en
- ReFuelEU Aviation – sustainable aviation fuels: https://ec.europa.eu/info/files/refueleu-aviation-sustainable-aviation-fuels_en
- Amendment to the Renewable Energy Directive (RED II): https://ec.europa.eu/info/files/amendment-renewable-energy-directive-implement-ambition-new-2030-climate-target_en



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CARBON MECHANISMS REVIEW



Baselines Expert Dialogue

The SBSTA Chair is currently conducting informal technical expert dialogues. The session on baselines and additionality is taking place on Oct 14. Find out more at https://unfccc.int/sites/default/files/resource/SBSTA_inf_work_2021-2022.pdf

Documentation of recent UNFCCC Art. 6 work

Read all documentation on the SBSTA chair's informal technical expert dialogues and the schedule at: <https://unfccc.int/process/the-paris-agreement/cooperative-implementation#eq-1>

Glossary

All Carbon Market terms and abbreviations are explained in detail in our online glossary. View it here: <https://www.carbon-mechanisms.de/en/glossary>