LIFE DICET

POLICY BRIEF

Linking Emissions Trading Systems with Different Offset Provisions

Highlights

- There is a very large cost-effectiveness potential for the implementation of offsets under Emissions Trading Schemes (ETSs).
- The scientific literature highlights that heterogeneity in offset provisions between prospective partners in an ETS linkage should be addressed for the sake of linking, but is not regarded as a priority.
- Co-benefits of offset projects are typically insufficiently incentivised, while adverse impacts have been reported on the local communities.
- In general, the experience with the Clean Development Mechanism (CDM) can greatly inform offset provisions design.
- Experts at the Carbon Market Policy Dialogue share insights on the most successful offset provisions.
- The Paris Agreement and its Article 6 can foster ETS linking, but requires additional coordination by prospective partners on key aspects.

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1 Introduction

In the context of the LIFE DICET project[1], the second session of the second Carbon Market Policy Dialogue (CMPD) on "*Environmental integrity: use of offsets*: implications for linking" took place on 9 July 2021. The CMPD sees the participation of the regulators of six major emissions trading systems (ETSs), namely those of the EU, California, China, Québec, New Zealand and Switzerland, and a number of international stakeholders, including policymakers, researchers as well as representatives of industry and civil society. In view of the meeting, a background report (Galdi et al., 2022) was produced. This policy brief offers an abridged version of the report and, in addition, it provides a selection of insights from the policy dialogue.

Most emissions trading systems around the world are experiencing a positive momentum: allowance prices are on the rise and carbon markets are attracting participation from financial operators. While high allowance prices are generally the sign of a stringent and, therefore, working ETS, very high prices pose at least two types of problems: one is the risk of crumbling political support for the ETS; the other concerns the possibility that, outside the ETS (whether in the same jurisdiction or not), much cheaper emissions abatement options are unexploited. In theory, the use of emission offsets, i.e. the use of emission credits for offsetting emissions, offers a solution to the second issue, as it allows for emissions abatement within the ETS to be replaced by cheaper abatement outside.[2] In this sense, the use of offsets offers efficiency gains that are similar to those achievable by linking ETSs with different abatement costs. Moreover, as cheaper abatement opportunities tend to be concentrated in less developed economies, emission offsets provide a platform for international cooperation that involves those. In practice, however, the experience with emission offsetting has so far been mixed or even controversial.

2 Conceptual framework

2.1 Main definitions

Environmental integrity

One focal topic concerning emission offsets is credibility of the underlying emission abatement, or, in other words, the environmental integrity of the credits/offsets. If there is any uncertainty on whether a credited tonne of CO_2 was actually abated by the originating project, the environmental value (and possibly also the market value) of the credit is compromised. If no or only partial abatement was actually achieved by the project that generated an emission credit and, yet, the same credit gave a firm the right to emit an additional tonne of CO_2, then clearly the offsetting system would cause an increase in overall emissions. In order to be credible, an emission credit should possess the following four qualities (Santikarn et al., 2018):

- **Reality**: The credit should certify mitigation efforts that have already occurred, rather than prospective ones;
- **Additionality**: The underlying mitigation outcomes should not have occurred in the absence of the carbon offsetting project. This implies that the project cannot be part of the plans of a regulating authority and that it would not be financially viable without the sale of carbon credits. To this end, a baseline scenario of emissions and foreseen mitigation actions can serve as a point of reference. An abatement would then be additional if it reduces emissions with respect to the baseline scenario.
- **Measurability**: The mitigation outcome that generates an emission credit should be quantifiable and verified. Also, to ensure transparency, verification of abatement should be performed by an independent entity, rather than by the project developer or by the government of the country hosting the project.
- **Permanence**: The emissions abated should not be reversible (e.g. by a forest fire in the case of a reforestation project).

1 FSR Climate is managing an EU funded project titled LIFE DICET (Deepening International Cooperation for Emissions Trading) which supports European Union and Member States policymakers in deepening international cooperation for the development and possible integration of carbon markets – website: lifedicetproject.eui.eu

2 While emission 'credit' refers to the achievement of a mitigation outcome, emission 'offset' refers to the use of a credit for compensating emissions.

If a credit lacks one or more of these qualities, its actual abatement value is doubtful. Therefore, if an ETS allowed the use of such credits for offsetting purposes, the environmental integrity of the ETS itself would be compromised.

Diversion of mitigation efforts

Independently of whether offset projects are domestic (i.e. located in the same jurisdiction as the ETS) or international (i.e. hosted in a foreign jurisdiction), they may discourage climate policy interventions. If a new or tighter climate policy would have been implemented in the baseline scenario (i.e. if the project had not existed), but it is instead delayed or suspended because of the project and its generation of emission credits, overall emissions may turn out to be higher than in the baseline scenario. Moreover, relying on offsetting as a strategy to lower compliance costs within an ETS may result in postponing investments in low-carbon technologies, by firms or countries, and thus increase long-term transition costs (de Alegría *et al.*, 2017). The continuation of the technological and socio-economic infrastructure that supports existing, more carbon-intensive technologies may induce carbon lock-in: a state of inertia of the economic system that makes structural changes more expensive or difficult (Unruh, 2000).

Broader impacts

As offsets projects are developed in a geographical, socioeconomic, and institutional context, they are also bound to have broader impacts on the country and the community in which they are located. On the one hand, some communities have contested that the implementation of the projects led to entrenching of gender stereotypes or human rights violations. On the other hand, offset projects may also bring relevant co-benefits to the communities they affect. Their implementation may create employment and thus contribute to poverty alleviation, while also potentially improving the health and the environmental quality of the territory.

Cost-effectiveness potential

Last but not least, it should be remarked that offsets have the potential to deliver sizable reductions in compliance costs under ETSs and, more in general, to enhance cost-effectiveness of mitigation actions. Indeed, emission offsets allow for the exploitation of cheaper mitigation alternatives, thus minimising the cost of abating a given amount of emissions. Against the background of the Nationally Determined Contributions (NDCs) pledged under the Paris Agreement, which will require an increase in the climate ambition of policy frameworks in all countries, it is easy to see how the cost-effectiveness of mitigation actions will constitute a treasurable quality. By reducing the cost of mitigation for a country, offsets may increase the likelihood that that country can fulfil its pledge or even pursue a more ambitious one.

2.2 Offset provisions

Offset provisions in an ETS may include limits of a qualitative or quantitative nature, or both. Quantitative limits enforce a maximum number of offsets/credits that can be used for compliance. They are typically implemented in the form of a maximum share of emissions that a regulated firm or installation is allowed to cover with offsets, instead of allowances. Alternatively, quantitative restrictions may be expressed in terms of a maximum share of an overall emission reduction target that can be achieved with offsets (e.g. the targets of the EU ETS and Switzerland's ETS). Qualitative limits, by contrast, do not impose a quantitative ceiling on the use of offsets. Rather, they restrict the types of activities that can generate eligible credits. ETS regulators may decide to accept credits only from certain specific activities or, more simply, they may prefer to exclude certain activities. Other restrictions could concern the geographical scope of the projects (e.g. international vs domestic) or the time of generation of the credits (e.g. the compliance period of the Kyoto Protocol). In an ETS, offset provisions typically include both qualitative and quantitative limitations. Of the six ETSs involved in the CMPD, all have some form of qualitative or quantitative restrictions in force, with the EU completely excluding the use of offsets in its ETS.

2.3 Interactions with the Paris Agreement

Adopted in 2015, the Paris Agreement is an international agreement under which all signatory countries pledge to achieve a NDC to halt climate change and to limit the global temperature increase to well below 2°C above pre-industrial levels, with determined efforts to stay below 1.5°C. The progress in mitigation efforts is regularly assessed at Global Stocktakes, the first of which is planned to take place in 2023 and which will inform the next round of NDC pledges. The parties to the Paris Agreement have a legally-binding obligation to present their NDC, but their fulfilment is not binding. This means that countries do not face direct negative consequences from failing to meet their pledged NDC. Signatory countries can present a double pledge too. They can specify whether the pledged target will be reached relying on international climate finance or global mitigation efforts ('conditional NDC'), or independent of them ('unconditional NDC'). The conditional NDCs are, thus, more ambitious and they include further mitigation actions that need enhanced cooperation to be enacted.

Among the cooperation mechanisms present in the Paris Agreement, Article 6.2 allows parties to engage in voluntary cooperation resulting in the transfer of Internationally Transferred Mitigation Outcomes (ITMOs) and in pursuit of their NDCs. Similarly, Article 6.4 establishes a crediting mechanism for emission reductions which can be described as the new and expectedly improved mechanism replacing the Kyoto Protocol's Clean Development Mechanism (CDM). The first mechanism, under Article 6.2, is largely conducted and authorised by the Parties participating in the transaction, whereas the second relies on supervision by a supranational body. A share of the proceeds from the latter mechanism are to finance administrative expenses and to support developing countries in their mitigation efforts.

ETS linking are considered one key application of the voluntary exchange of ITMOs under Article 6.2. Implications of ETS linking on the achievement of NDCs are discussed in a specific ICAP report (Schneider et al., 2018). In addition, linked ETSs may be affected by the Paris Agreement if one or more of the linked jurisdictions establish some degree of interchangeability between their own emission allowances and the ITMOs. We have identified three channels of interactions between ETS linkages and the Paris Agreement:

- **Double counting**: If one jurisdiction in a linkage were to use credits that are counted towards the NDC of more than one entity, the environmental integrity of the linked market would be compromised. In this regard, the COP26 resulted in clear safeguards against double counting, introducing the principle of "corresponding adjustments", by which the parties engaging in an exchange mark the units transferred with opposite signs.
- **Target setting**: The canonical approach for increasing the environmental ambition of an ETS is lowering its cap (if present). However, in theory, if one jurisdiction in a linkage were to sell its allowances as ITMOs, the price on the international carbon market could discourage the policymakers from decreasing the cap in the future. To the extent that this limits the convergence in environmental ambition with other ETSs, this might constitute an obstacle to a linkage (Verde et al., 2020).
- **ITMOs as compliance units**: While at the time of writing the nature of ITMOs is still not perfectly defined, the decision to use tonnes of CO_2e greatly facilitates an equivalence with allowances from ETSs (Schneider *et al.*, 2018). This means that, from a technical perspective, one ETS regulator in a linkage could decide to accept ITMOs as compliance units. If its cap is not reduced by an equivalent amount of allowances, the cap of the linked market would be effectively increased, putting downward pressure on prices and compromising the functioning of the carbon markets.

3 A brief history of offsets use under ETSs

The first experience of ETSs with emission offsetting is related to the Kyoto Protocol's 'flexible mechanisms', namely the CDM and the Joint Implementation (JI). While in theory the use of offsets in ETSs was meant to enhance cost-effectiveness in emission abatement, reality often turned out to be different. In the case of the EU ETS, major inflows of emission credits from the CDM and the JI, de facto raised the cap on regulated emissions. This aggravated a market imbalance that was mainly due to the effects of the Great Recession (2007-2009), thus further depressing allowance prices and undermining the cost-effectiveness of the system over the long term.

3.1 Missteps in carbon offsetting

We now briefly review the history of the most controversial aspects of offsets use, including concerns about their environmental integrity and their broader impacts on communities. We mainly focus on the CDM established under the Kyoto Protocol, for the abundance of literature studying this specific mechanism and for its prominent role as a crediting mechanism.

Environmental integrity

The main criticism towards CDM credits in relation to an ETS concerns their environmental integrity, that is, the equivalence of the amount of CO_2 mitigated by the offset projects to the additional polluting rights granted under an ETS. In a much-cited report, Cames et al. (2016) note that only 2% of the projects that they reviewed, and 7% of the corresponding credits supply, had a high likelihood of bringing about actual (i.e. additional) emission reductions. For most projects with a low additionality score, emission credits funding covered only a minor part of the necessary funding, casting doubts on the assumption that investments would not have been made without the implementation of the offset projects. By contrast, the costs of hydrofluorocarbons (HFC) destruction were found to be generally low and were largely covered by crediting. While scholars found that perverse economic incentives actually led to increased production in these industrial gasses (Schneider and Kollmuss, 2015; Haya et al., 2020; Schneider, 2011), once these concerns were adequately addressed in a later version of CDM methodology, mitigation from HFC projects was deemed additional with high likelihood (Cames et al., 2016). Another criterion used to assess the additionality of an offset project is the level of emissions as compared to a baseline scenario. A problem with this approach is that if the project developers can influence the baseline to apply, they have an incentive to inflate the baselines to artificially increase the estimated volume of abated emissions (Michaelowa, 2012; Lazarus and Chandler, 2011; du Monceau and Brohé, 2011). Similarly, to attract more international finance in their jurisdiction, policymakers might also attempt to influence the baseline to be applied. Indeed, depending on how additionality is measured, policymakers may be able to alter the additionality status of projects in order to attract more international finance (Dulaney et al., 2017; He and Morse, 2013).

Diversion of mitigation efforts

Even without affecting baselines, policymakers might find themselves influencing project implementation, shying away from mitigation policies in sectors where offsets projects are developed, in order not to discontinue international funding. The decision of the US not to regulate federal methane emissions from coal mines could have been influenced by the role of these emissions in creating opportunities for cheap offsets for California's ETS (Haya et al., 2020). A similar concern affects the aforementioned HFC destruction projects, as their relatively low costs makes crediting very profitable, thus discouraging policy action (Cames et al., 2016). Developing countries are particularly exposed to the risk of reduced mitigation efforts as a consequence of offsets project implementation. Indeed, projects in developing countries increase their marginal abatement costs, inducing them to reduce their own mitigation efforts. Empirical evidence on CDM projects supports this hypothesis, thus pointing to the need for enhanced benefits for developing countries (Stahlke, 2020). These examples show how assessing the additionality of offsets proves a challenge because of the lack of counterfactual action by policymakers.

Carbon leakage

Finally, it should be noted that emission offsets may also suffer from carbon leakage, that is, the phenomenon by which a given reduction in emissions delivered by a policy is at least partly compensated by an increase in emissions in

another place, time, or sector. In the context of offsets, carbon leakage may be either direct or indirect. Direct carbon leakage occurs whenever emissions result from the implementation of the offsets project itself. In an example concerning the substitution of cropping land use with pasture, scholars highlighted that carbon leakage from the activities deriving from the usage of the pasture might increase carbon emissions with respect to the baseline scenario (Thamo and Pannell, 2016). Indirect carbon leakage may also derive from market effects, whenever demand for a relatively more carbon-intensive product increases as a consequence of the offset projects. For example, forest projects might be exposed to indirect carbon leakage insofar as they induce an increase in demand for imported wooden products, thus likely increasing deforestation elsewhere (Haya, 2019).

Human rights violations

The human rights implications of CDM projects deployment are underrepresented in the scientific literature compared to other aspects of offsets; most evidence relating to these areas was gathered and published by NGOs and civil society organisations (Schade and Obergassel, 2014). Case studies illustrate how hydropower projects benefiting from carbon crediting finance have been forcefully implemented to the detriment of the local population (see Galdi et al, 2022 for a more detailed review of case studies).

While countries hosting projects that generate emission credits are responsible for ensuring that the projects do not involve any human rights violations (Schade and Obergassel, 2014), no provisions that directly address human rights were included in the CDM framework. Nor were there any strong international guarantees that projects implemented in violation of human rights would not be credited with valid credits. This delay was also due to some developing countries refusing to attach human rights standards to credit generation, claiming that it would violate their national sovereignty (Schade and Obergassel, 2014; Yamin and Depledge, 2004).

In this regard, the COP26 outlined some principles for the eligibility of carbon offsetting projects, that include authorisation by the government of the host country and consultation with stakeholders. There provisions are to guide the supranational supervisory body in establishing the requirements and processes necessary to operate the carbon crediting mechanism. These provisions confirm the importance acknowledged by the Paris Agreement (already in its preamble) to safeguarding communities from adverse societal impacts. As argued by Schade and Obergassel (2014) and Cournil et al. (2012) in the context of the CDM, in order to guarantee that no human rights violation underlies emission credits, it is essential that projects are eligible to issue credits only once they have undergone a Human Rights Impact Assessment (HRIA).

Gender equality

Offset projects may also have implications for gender equality by affecting women positively or negatively. For instance, cookstove projects are presented as being capable of generating sizable economic and time savings for women, allowing them to focus on other economic or care activities. The same projects, however, have been criticised too, as they might consolidate the traditional roles of women in society, rather than increasing their leverage within said societies and their families (Lehman, 2019). In general, while women are recognised as being disproportionately exposed to climate change, their role as agents of change for scaling up climate mitigation activities is often overlooked (Glemarec et al., 2016). Offsetting projects have the potential to increase the economic independence of women and to reduce their burden of care work. But clear guidelines would be needed to secure the gender equality co-benefits in all projects (UNDP, 2011). In order to empower women, gender equality perspectives should be streamlined across the whole process of the financing of mitigation activities, including the supply chains and employment involved (Glemarec et al., 2016; UNDP, 2011). Furthermore, to increase the direct participation of women in mitigation projects, gender-biased procedural obstacles should be identified and removed. To foster the development of gender-sensitive offsetting projects, jurisdictions might also explicitly include gender equality requirements for credits admitted under their ETS (UNDP, 2011). Gender equality remains difficult to assess for its pervasiveness in the life of women. However, dedicated emission offsets standards have been recently developed and their demand is increasing in the voluntary carbon market (WOCAN, 2021).

Foregone economic and health co-benefits

Focusing now on the potential co-benefits of emission offsets, that is, their positive externalities to the local communities, the overall performance of CDM offsets seems to be poor, though with significant spatial and technological heterogeneity (Hultman et al., 2020). For instance, a variety of offset projects, ranging from energy-related to forest ones, enhanced the quality of water basins in the proximity of the implementation area (Karlsson et al., 2020; Anderson et al., 2017, Torres et al., 2015). By contrast, employment co-benefits in developing countries were found to be short-lived at best. On average, they dwindled after about three years from project implementation (Mori-Clement and Bednare-Friedl, 2019; Crowe, 2013). On the bright side, the weak link with employment in developing countries also means that the collapse of the CDM credit price did not have major negative repercussions on employment. Employment effects also show strong sectoral heterogeneity. Employment in some sectors was positively affected (e.g. construction), whereas others suffered economic damages (e.g. agriculture) (Mori-Clement and Bednar-Friedl, 2019).

In general, scholars highlight that when there are trade-offs between climate change mitigation and other societal objectives, project developers tend to focus on emissions abatement, since crediting proceeds depends on the latter (see Freeman and Zerriffi, 2012 for a review of health co-benefits of cookstove projects, and Hultman et al., 2020 for a broader review of co-benefits). The economic incentive linked to emission abatement is, therefore, insufficient for bringing about broader co-benefits and a market premium needs to be applied to reward projects with a positive societal impact (Dulaney et al., 2017; Crowe, 2013).

3.2 Offsets use and ETS linking

A dedicated literature on the implications for ETS linking of heterogeneity in offset provisions does not really exist. However, some scholarly works dealing with the possible barriers to ETS linking do touch upon offsets provisions. From a technical perspective, perfect harmonisation of offsets provisions is not deemed to be necessary, as the linking arrangement between California and Quebec demonstrates. While the two jurisdictions apply the same quantitative limit to offsets use (8% of emissions covered by allowances), they differ in the qualitative limits (Purdon et al., 2014). However, there are reasons for which harmonisation over offset provisions might be regarded as being highly relevant in economic and political terms. Different qualitative restrictions, in particular, may reflect different preferences or priorities of policymakers. If so, harmonisation could become a politically sensitive matter and thus hinder linking negotiations (Burtraw et al., 2013; Hawkins and Jegou, 2014; Tuerk et al., 2009). Differences in quantitative restrictions appear to be more relevant to the economic dimension. It has been noted that if one ETS accepts credits as compliance units, while the other does not (or only to a lesser extent), entities under the first scheme will likely use cheaper credits for compliance up to their maximum. By doing so, they would 'free up' allowances that could be sold to the other jurisdiction (Santikarn et al., 2018; Kachi et al., 2015; Lazarus et al., 2015; Burtraw et al, 2013; Zetterberg, 2012). While quantitative limits on offsets use may shelter an ETS from external price fluctuations (Diaz-Rainey and Tulloch, 2018), if the same limits do not apply in all linked ETSs, then the 'freeing up' effect would still hold in some measure (Lazarus et al., 2015; Beuermann et al., 2017; Santikarn et al., 2018).

Overall, the literature seems to indicate that differences in quantitative limits to the use of offsets between ETSs reflect a more general divergence in terms of climate ambition. As to qualitative limits, a sufficiently high level of trust seems to be required for regulators to overcome their reluctance to accept reciprocal standards. Arguably, if both sufficient convergence on ambition (stringency) and mutual trust are necessary pre-conditions for any linking negotiation to start (Verde et al., 2020; Mehling and Haites, 2009), the alignment of offsets provisions is a necessary condition for a linkage negotiation to succeed.

4 Insights from the CMPD

A preliminary version of the report summarised in this policy brief was presented as the background material for a session of the CMPD convened within the framework of the Life DICET project. Five international experts acted as speakers, while many others engaged in a very lively debate that followed the presentations. Here we summarise the main takeaways from such discussion. First of all, the very purpose of including offsets within an ETS did not find a consensus

within the participants. Some argued that the purpose of offsets is to contain compliance costs for covered entities while exploiting cost-effective mitigation opportunities, whereas others claimed that the main purpose of offsets is, or should be, to apply a carbon price to sectors not covered by the ETS. This division comes from diverging perspectives towards credits and offsets with respect to any other mitigation activity that is conducted outside an ETS. Some participants stressed that mitigation actions performed within an ETS are not significantly different from any similar action performed outside of it. Therefore, they face the same challenges to environmental integrity and should be addressed in the same way. In this perspective, using credits is but a way to extend carbon pricing to sectors not covered by the ETS. If all activities were subject to a cap, carbon units (or credits) could be exchanged just like allowances are traded under an ETS. Such an economy-wide cap would also ease the pressure for seeking high quality credits, as stringent caps would ensure environmental integrity *per se*. The counterargument, supported by other participants, built on the administrative and political hurdle of including all activities under an ETS and monitoring their emissions. Furthermore, economy-wide caps and baselines are challenging to convene and are indeed absent even from the Paris Agreement. Moreover, the carbon price resulting from an economy-wide cap could be too low to support mitigation actions in industrial sectors, leading to an inefficient postponement of decarbonisation investments.

On a more technical level, the participants highlighted the most important elements to preserve the environmental integrity of an ETS. The experience of the ETS regulators present at the CMPD supported the importance of robust verification protocols. The presence of positive lists of sectors that could generate credits was also generally appreciated by participants, although they warned that they are not sufficient to guarantee the additionality of projects. Assessing additionality on a project basis, rather than on a sector basis, is indeed crucial to define more accurate benchmarks for the mitigation action and the technology involved. In addition, making the buyer liable for the quality of the offset fosters a process of self-policing within the carbon market, by which buyers of credits are willing to pay premia for higher quality credits. The California ETS is one exemplary case of this 'buyer liability'. From an economic perspective, participants suggested considering that a higher carbon price of mitigation actions is associated with a lower share of non-additional actions. Admitting instruments whose carbon price is beyond a given threshold might thus reduce the risk of non-additionality of the mitigation actions. Finally, including offsets within the ETS cap preserves environmental integrity by design, as the overall number of emissions remains the same. This is the case, for instance, of the EU ETS during its Phase III (2013-2020), when firms were required to exchange their offsets for allowances, so that the offsets did not constitute supply in excess of the cap.

Another focal point of the debate was the inclusion of carbon removals under ETSs. On the one hand, carbon removal technologies are still in their nascent phase and could require some form of support to be deployed at scale. Moreover, since the net carbon neutrality objective of many countries[3] is set at a not-so-distant 2050, the technology and the policy framework should be developed as soon as possible to allow for harnessing the benefits of carbon removals when decarbonisation actions will have become more and more expensive. With carbon prices on a upward trajectory worldwide[4], carbon removals may become a vital support in decarbonisation efforts. In addition, and connected to the previous issue, if an economy-wide cap is adopted, it would make sense to treat removals just as any emissions reduction unit. On the other hand, introducing carbon removals into the ETSs might bring unwelcome volatility to the carbon price, putting a downward pressure and inducing an inefficient postponement of low-carbon investments. In this perspective, maintaining two different systems to reward removals and reductions could shelter the allowance market while nurturing the nascent supply of removals. It has also been remarked that, depending on the nature of the removal, it might not even need any financial assistance, insofar as the removal activity produces a marketable output, as is the case with biochar (Verde and Chiaramonti, 2021).

3 Of the jurisdictions involved in the CMPD, the EU, the US, Canada, New Zealand, and Switzerland set a carbon neutrality target for 2050, while China has set it for 2060.

4 At the time of writing, the Fit for Fifty-five package has been recently proposed by the European Commission (14 July 2021). Among the 13 legislative proposals, there is a reform of the EU ETS introducing a more ambitious 4.2% linear reduction factor, up from the current 2.2%.

Zooming in on the implications of different offset provisions for ETS linking, participants pointed to a broader alignment on stringency of provisions as the most crucial aspect for linkage, rather than on specific elements such as qualitative or quantitative limitations. If one prospective partner is considered as not having enough safeguards against bad credits, this would very likely constitute a barrier to linking. If no such barrier is present, the use of offsets in partner ETSs has been considered as a generally positive design element, as it increases liquidity and reduces price volatility. One prominent platform for indirect linking between ETSs is represented by the possibility to trade internationally transferable mitigation outcomes via the market-based mechanism that should be established under Article 6.4 of the Paris Agreement. The indirect linking of ETSs through the Paris Agreement has the potential to guarantee good carbon unit quality and thus allow ETSs to trade mitigation outcomes preserving environmental integrity. If ETS regulators find the principles of the Paris Rulebook to be sufficiently stringent to be coherent with their own offset provisions, direct ETS linking could take the back seat in international climate cooperation. In this regard, participants underlined that it is crucial for the Paris Rulebook to go a step further with respect to the CDM methodologies and that Article 6 pilots show uncertain progress on this.

The participants offered a few perspectives on how the Paris era should look like. First of all, the very definition of additionality might have to change to represent all mitigation actions that go beyond current NDCs. As already mentioned in this report, one key aspect is the difference between conditional and unconditional NDCs in terms of whether international mitigation outcomes may be used for its fulfilment. In addition, a uniform and simple way to define NDC targets for each year should be designed. Two solutions proposed built on the idea of an automatically declining baseline. One solution was to contrast achieved emissions against an absolute BAU baseline that would however linearly decline in time, so that Parties would need to abate more emissions each year to gain the right to the same amount of tradeable mitigation outcomes. The other solution proposed to use intensity baselines instead, which would be automatically reduced by a (linear) 'ambition coefficient' that varies for each country. In this way, least developed countries could still generate tradeable mitigation outcomes after most countries hit their carbon neutrality target. However, both solutions follow a top-down approach that some participants found politically unfeasible, as countries want to be able to set their NDCs independently. Finally, there was a strong consensus on the need for clear rules eliminating the risk of double counting and preventing overallocation and trading of 'hot air', i.e. credits deriving from lenient baseline setting. If the baselines are ambitious and no Party is thus granted 'windfall' credits, concerns over the environmental integrity become less urgent.

5 Discussion and conclusions

Well-designed offsets to boost climate action

Keeping the global average temperature increase well below 2 °C (the target of the Paris Agreement) will require some countries to hit an implicit carbon price of roughly $100/tonne of CO_2 by 2030 (IETA and University of Maryland, 2019). While allowance prices have been rising in all operational ETSs involved in the CMPD during the last year, and the price of EUAs indeed reaching up to €90 towards the end of 2021, an international carbon price of $100/tonne of CO_2 remains a tough challenge. ETS regulators might want to include offsets within their systems as the appetite for reducing compliance costs will likely increase over time, regardless of considerations about international cooperation and support of developing countries. In fact, emission offsets will very likely be needed to achieve increasingly ambitious climate goals. It is, therefore, fundamental to understand what offsets provisions can allow for enhanced cost-efficiency while safeguarding environmental integrity.

The scientific literature has identified a number of measures that would be useful for ensuring the environmental integrity of offsets in the context of an ETS. First, scholars have recommended to only consider projects that prove themselves financially unsustainable without crediting funds (Cames et al., 2016; Claassen et al., 2014). The reason is that projects with returns on investment that are already competitive relative to the market would be implemented anyway, i.e. even without crediting. As such, they would not be additional. Secondly, project-type or sector-specific methodologies are preferable to generic one-

size-fits-all criteria addressing all project types (Cames et al., 2016). Still, some over-crediting could arise given potential pressure on policy-makers from project developers and even from credit buyers (Haya et al., 2020). Thirdly, in the context of an ETS with a fixed cap, scholars suggest that credits should not be used to de facto increase the cap. This implies that for every emission credit used in the system, an emission permit would have to be cancelled. Furthermore, the role of offsets should be minor and international credits should mainly come from mitigation activities in developing countries (Haya et al., 2020; Cames et al., 2016).

Overall, adherence to these guidelines reflects a commitment to environmental integrity and, therefore, to environmental ambition too. The scientific literature does not identify major technical barriers to linking ETSs with different offset provisions. However, it seems politically difficult and implausible to link systems whose offset provisions reflect very different levels of environmental ambition (see Verde et al., 2020).

The crucial pieces of Article 6

The market-based mechanisms under Article 6 of the Paris Agreement could play a decisive role in fostering the integration of carbon markets. The possibility of exchanging mitigation outcomes between parties may yield sizable cost savings, which a recent study has estimated at about $250 billion per year by 2030 for achieving the 2 °C target of the Paris Agreement (IETA and University of Maryland, 2019). Besides, if these savings were channelled to enhance mitigation efforts, an additional 520 $GtCO_2$ could be abated. According to the same study, if all countries participated in a common market-based mechanism, the carbon price requirement to achieve the 2 °C target would be much lower, staying at about $38 in 2030 and only rising to $107 by 2050. However, the environmental integrity of systems linking with this common carbon market would hinge on the specific methodologies of the Paris Rulebook, whose details are yet uncertain at the time of writing.

First of all, it is important to stress the difference between unconditional and conditional NDCs and its implications for the trade of ITMOs. Intuitively, allowing countries to sell ITMOs while not having achieved their own unconditional NDC, would likely jeopardise the environmental effectiveness of the whole system. Similarly, on the demand side, it could be argued that Parties should tackle unconditional targets with national policies and that they should only be allowed to use ITMOs to cover their conditional and more ambitious NDCs (Carbon Market Watch, 2020; Spalding-Fecher et al., 2017). The diverse nature of the NDCs adds to their complexity, as some of them are not expressed in terms of CO_2 abatement (absolute targets), but rather as carbon intensity (relative targets) or as climate-related objectives[5] (indirect targets) (Schneider and Laz Hoz Theuer, 2019). Against this background, understanding the extent to which one 'mitigation unit' is in excess of the unconditional NDC is even more challenging.

Secondly, and particularly relevant for this report, ETS regulators might consider admitting ITMOs as compliance units and exchanging them between linked systems. As long as the use of ITMOs under ETSs is not in excess of the cap (if there is a cap) and the mitigation outcomes transferred only involve activities covered by the systems (i.e. they are represented by allowances), this would ensure exchanges with high environmental integrity (Schneider and La Hoz Theuer, 2019). However, this could increase demand for allowances in those ETSs whose allowance prices are lower, thus putting its carbon market under pressure. Similarly to what is proposed for import of allowances between linked ETSs (Lazarus et al., 2015), limits on the number of ITMOs that can be exchanged by each jurisdiction could effectively contain this problem. The flip side is reduced participation in the global carbon market and thus reduced trade gains (La Hoz Theuer et al., 2019; Gavard et al., 2016). If this solution were to be investigated, allocating a maximum number of ITMOs that can be issues, transferred, or acquired could be more effective and simpler than quantitative limits based on historical or projected (BAU) emissions (La Hoz Theuer et al., 2019). If one ETS opens to admitting ITMOs from activities not covered by an ETS (i.e. they are not allowances), its environmental integrity depends on the safeguards agreed upon in the Paris Rulebook. Unless robust eligibility criteria are applied, this could undermine linking negotiations, due to concerns over environmental integrity.

Thirdly, many NDCs pledges are expressed in terms of single-year targets, e.g. emissions abated in 2030 with respect to historical

5 For instance, the share of final energy consumption from Renewable Energy Sources.

emissions. However, the financial cycle of offset projects typically involves different time spans and credits issuance occurs over multi-year periods. Aligning the time frames of NDCs with the ones of offset projects is important for a robust accounting of emissions and to accurately assess the mitigation outcomes. This is especially relevant to limiting exchanges of mitigation outcomes to the over-achievement of NDCs (Schneider and La Hoz Theuer, 2019; Spalding-Fecher et al., 2017; Cames et al., 2016).

Finally, voluntary carbon markets (VCMs) deserve a special mention. The above-mentioned distinction between unconditional and conditional NDCs has implications for the admissibility of Voluntary Emission Reductions (VERs) towards the achievement of NDCs. While there is little uncertainty that cooperation and financing mechanisms (including VCMs) may be employed in pursuit of conditional pledges, it is not clear whether they could also be used for the fulfilment of unconditional pledges. Avoidance of double counting and the principle of additionality would require VERs purchased and claimed by a firm not to be ascribable towards the fulfilment of national NDCs. As such, VCMs could either give rights to claim international support, instead of emission abatement, or be limited towards the fulfilment of conditional pledges (Leining and White, 2021; Stahlke, 2020; Spalding-Fecher et al., 2017). Operators developing offsetting projects for the VCMs took different stances on these issues: while Gold Standard acknowledged the need for a corresponding adjustment for emissions covered by the Paris Agreement, Verra argued against it (Carbon Pulse, 2021; Gold Standard, 2021; Verra, 2021).

Low-hanging fruits vs scaffolding investments

The Paris Agreement reiterates the principle that countries have common but differentiated responsibilities and that "support should be provided to developing countries". Participation in the market-based mechanisms under Article 6 could channel valuable resources to developing countries, where emissions abatement is cheaper than in industrialised countries. However, to ensure that these resources actually support the transition to a low-carbon economy in developing countries, long-term impacts on emissions abatement costs are fundamental. If the financial resources under the Article 6 market-based mechanisms are directed towards low-hanging fruit – i.e. the cheapest or simplest abatement options – it could make achievement of the NDCs much more difficult for developing countries. The experience with the CDM shows that projects increased their abatement cost for developing countries, which in turn reduced mitigation efforts by hosting national legislators (Stahlke, 2020). In theory, this reduction in mitigation efforts might be addressed through making NDCs mandatory (e.g. sanctioning non-compliant entities) or through enhancing offset projects with valuable co-benefits for developing countries (Stahlke, 2020).

Another possibility would be to use the $100 billion per year fund that industrialised countries committed to raise in support of mitigation and adaptation activities in developing countries. At present, however, the target is still unmet, as industrialised countries convened at COP26 postponed its fulfilment to 2023. It is important to remark that the financial support requested by developing countries and least developed island nations far exceeds the $100 billion fund, even if it were to be renewed until 2030 (Pauw et al., 2020). These financial resources could significantly help developing countries in reducing their abatement costs, at least partially compensating for the increase induced by the sale of ITMOs under the market-based mechanisms of Article 6. If a quantitative absolute limitation were to be imposed on participation in the market-based mechanism (as suggested in La Hoz Theuer et al., 2019, Schneider and La Hoz Theuer, 2019, and Gavard et al., 2016), the effect on marginal abatement costs of developing countries could be contained. This would be done at the price of lower climate benefits on a global scale, however (La Hoz Theuer et al., 2019). A more general principle concerning the use of ITMOs and offsets by industrialised countries would be to use emission offset to abate 'residual' (i.e. hard to abate) emissions, rather than to substitute for domestic mitigation. Another pathway would be to qualitatively limit crediting to projects aimed at closing a specific technological gap, empowering developing countries to abate at a lower cost in the future, while also providing co-benefits in the form of knowledge spillovers.

Reference list (APA style)

Anderson, C. M., Field, C. B., & Mach, K. J. (2017). Forest offsets partner climate-change mitigation with conservation. Frontiers in Ecology and the Environment, 15(7), 359-365.

Beuermann, C., Bingler, J., Santikarn, M., Tänzler, D., & Thema, J. (2017). Considering the effects of linking emissions trading schemes: A manual on bilateral linking of ETS. Berlin: German Emissions Trading Authority (DEHSt) at the German Environment Agency.

Burtraw, D., Palmer, K. L., Munnings, C., Weber, P., & Woerman, M. (2013). Linking by degrees: Incremental alignment of cap-and-trade markets. Resources for the Future DP, 13-04.

Cames, M., Harthan, R. O., Füssler, J., Lazarus, M., Lee, C. M., Erickson, P., & Spalding-Fecher, R. (2016). How additional is the clean development mechanism. Analysis of the application of current tools and proposed alternatives.

Carbon Market Watch. (2020). Above and Beyond Carbon Offsetting: Alternatives to Compensation for Climate Action and Sustainable Development. Policy briefing.

Carbon Pulse. (2021). Verra will not require corresponding adjustments for voluntary offset transactions, https://carbon-pulse.com/127198/, last accessed 16 September 2021.

Claassen, R., Horowitz, J., Duquette, E., & Ueda, K. (2014). Additionality in US agricultural conservation and regulatory offset programs. USDA-ERS Economic Research Report, (170).

Cournil, C., & Tabau, A. S. (2012). Human rights and climate change: EU policy options. European Parliament.

Crowe, T. L. (2013). The potential of the CDM to deliver pro-poor benefits. Climate Policy, 13(1), 58-79.

de Alegría, I. M., Fernández-Sainz, A., Alvarez, I., Basañez, A., & del-Río, B. (2017). Carbon prices: Were they an obstacle to the launching of emission abatement projects in Spain in the Kyoto Protocol period?. Journal of Cleaner Production, 148, 857-865.

Diaz-Rainey, I., & Tulloch, D. J. (2018). Carbon pricing and system linking: lessons from the New Zealand emissions trading scheme. Energy Economics, 73, 66-79.

du Monceau, T., & Brohé, A. (2011). Briefing paper "Baseline Setting and Additionality Testing within the Clean Development Mechanism (CDM)". London: AEA.

Dulaney, S., Greenbaum, E., Hunt, J., & Manya, D. (2017). Carbon Offsets and Health Co-Benefits.

Finley-Brook, M., & Thomas, C. (2010). Treatment of displaced indigenous populations in two large hydro projects in Panama. Water Alternatives, 3(2), 269.

Freeman, O. E., & Zerriffi, H. (2012). Carbon credits for cookstoves: Trade-offs in climate and health benefits. The Forestry Chronicle, 88(5), 600-608.

Galdi, G., Verde, S. F., Borghesi, S., Füssler, J., Jamieson, T., Soini, M., Wimberger, E., & Zhou, L. (2022). Emissions trading systems with different offsets provisions: implications for linking. report for the carbon market policy dialogue. Technical Report 2022/01 (LIFE DICET project), Florence School of Regulation, European University Institute, Florence.

Gavard, C., Winchester, N., & Paltsev, S. (2016). Limited trading of emissions permits as a climate cooperation mechanism? US–China and EU–China examples. Energy Economics, 58, 95-104.

Glemarec, Y., Qayum, S., & Olshanskaya, M. (2016). Leveraging co-benefits between gender equality and climate action for sustainable development: Mainstreaming Gender Considerations in Climate Change Projects. UN Women.

Gold Standard. (2021). Integrity For Scale: Aligning Gold Standard-Certified Projects With The Paris Agreement, https://www.goldstandard.org/sites/default/files/documents/integrity_for_scale_aligning_gs_certified_projects_with_the_paris_agreement.pdf, last accessed 16 September 2021.

Hawkins, S., & Jegou, I. (2014). Linking Emissions Trading Schemes. Considerations and Recommendations for a Joint EU-Korean Carbon Market. ICTSD Global Platform on Climate Change, Trade and Sustainable Energy.

Haya, B., Cullenward, D., Strong, A. L., Grubert, E., Heilmayr, R., Sivas, D. A., & Wara,

M. (2020). Managing uncertainty in carbon offsets: insights from California's standardized approach. Climate Policy, 20(9), 1112-1126.

Haya, B. (2019). Policy brief: The California Air Resources Board's US Forest offset protocol underestimates leakage. Center for Environmental Public Policy, University of California, Berkeley, https://gspp. berkeley. edu/assets/uploads/research/pdf/Policy_Brief-US_Forest_Projects-Leakage-Haya_2. Pdf.

He, G., & Morse, R. (2013). Addressing carbon offsetters' paradox: lessons from Chinese wind CDM. Energy Policy, 63, 1051-1055.

Hultman, N., Lou, J., & Hutton, S. (2020). A review of community co-benefits of the Clean Development Mechanism (CDM). Environmental Research Letters, 15(5), 053002.

International Emissions Trading Association (IETA) and University of Maryland. (2019). The Economic Potential of Article 6 of the Paris Agreement and Implementation Challenges. Washington, D.C.

Kachi, A., Unger, C., Böhm, N., Stelmakh, K., Haug, C., & Frerk, M. (2015). Linking emissions trading systems: A summary of current research. International Carbon Action Partnership.

Karlsson, M., Alfredsson, E., & Westling, N. (2020). Climate policy co-benefits: a review. Climate Policy, 20(3), 292-316.

Kuriyama, A., & Abe, N. (2018). Ex-post assessment of the Kyoto Protocol–quantification of CO2 mitigation impact in both Annex B and non-Annex B countries. Applied Energy, 220, 286-295.

La Hoz Theuer, S., Schneider, L., & Broekhoff, D. (2019). When less is more: Limits to international transfers under Article 6 of the Paris Agreement. Climate Policy, 19(4), 401-413.

Lazarus, M., Schneider, L., Lee, C., & van Asselt, H. (2015). Options and issues for restricted linking of emissions trading systems. ICAP: Berlin.

Lazarus, M., & Chandler, C. (2011). Coal power in the CDM: Issues and options. Stockholm Environment Institute.

Lehmann, I. (2019). When cultural political economy meets 'charismatic carbon' marketing: A gender-sensitive view on the limitations of gold standard cookstove offset projects. Energy Research & Social Science, 55, 146-154.

Leining, C. & White, D. (2021). Boosting voluntary climate action in Aotearoa New Zealand, Motu Economic and Public Policy Research.

Mason, C. F., & Plantinga, A. J. (2012). The additionality problem with offsets: Optimal contracts for carbon sequestration in forests. Journal of Environmental Economics and Management. Journal of Environmental Economics and Management, 64, 288-300.

Mehling, M., & Haites, E. (2009). Mechanisms for linking emissions trading schemes. Climate Policy, 9(2), 169-184.

Michaelowa, A. (2012). Determination of baselines and additionality for the CDM: A crucial element of credibility of the climate regime. In Climate Change and Carbon Markets (pp. 329-344). Routledge.

Mori-Clement, Y., & Bednar-Friedl, B. (2019). Do clean development mechanism projects generate local employment? Testing for sectoral effects across Brazilian municipalities. *Ecological economics*, *157*, 47-60.

Pauw, W. P., Castro, P., Pickering, J., & Bhasin, S. (2020). Conditional nationally determined contributions in the Paris Agreement: foothold for equity or Achilles heel? Climate policy, 20(4), 468-484.

Purdon, M., Houle, D., & Lachapelle, E. (2014). The political economy of California and Quebec's cap-and-trade systems. Sustainable Prosperity (University of Ottawa).

Santikarn, M., Li, L., La Hoz Theuer, S., & Haug, C. (2018). A guide to linking emissions trading systems, ICAP: Berlin.

Schade, J., & Obergassel, W. (2014). Human rights and the clean development mechanism. Cambridge Review of International Affairs, 27(4), 717-735.

Schneider, L. (2009). Assessing the additionality of CDM projects: practical experiences and lessons learned. Climate Policy, 9(3), 242-254.

Schneider, L. R. (2011). Perverse incentives under the CDM: an evaluation of HFC-23 destruction projects. Climate Policy, 11(2), 851-864.

Schneider, L., & Kollmuss, A. (2015). Perverse effects of carbon markets on HFC-23 and SF 6 abatement projects in Russia. Nature Climate Change, 5(12), 1061-1063.

Schneider, L., Cludius, J., & La Hoz Theuer, S. (2018). Accounting for the linking of emissions trading systems under Article 6.2 of the Paris Agreement. Berlin: International Carbon Action Partnership (ICAP).

Spalding-Fecher, R., Sammut, F., Broekhoff, D., & Füssler, J. (2017). Environmental integrity and additionality in the new context of the Paris Agreement crediting mechanisms. Carbon Limits.

Stahlke, T. (2020). The impact of the Clean Development Mechanism on developing countries' commitment to mitigate climate change and its implications for the future. *Mitigation and Adaptation Strategies for Global Change*, *25*(1), 107-125.

Thamo, T., & Pannell, D. J. (2016). Challenges in developing effective policy for soil carbon sequestration: perspectives on additionality, leakage, and permanence. Climate Policy, 16(8), 973-992.

Torres, A. B., MacMillan, D. C., Skutsch, M., & Lovett, J. C. (2015). Reprint of 'Yes-in-my-backyard': Spatial differences in the valuation of forest services and local co-benefits for carbon markets in México. Ecological economics, 117, 283-294.

Tuerk, A., Mehling, M., Flachsland, C., & Sterk, W. (2009). Linking carbon markets: concepts, case studies and pathways. Climate Policy, 9(4), 341-357.

United Nations Development Programme (UNDP). (2016). Ensuring gender equity in climate change financing, https://www.undp.org/sites/g/files/zskgke326/files/publications/EngendCC_7.pdf, last accessed on 16 September 2021.

Unruh, G. C. (2000). Understanding carbon lock-in. Energy policy, 28(12), 817-830.

Verde, S. F., & Chiaramonti, D. (2021). The biochar system in the EU: the pieces are falling into place, but key policy questions remain. Policy Brief 2021/08, Florence School of Regulation, European University Institute, Florence.

Verde, S. F., Galdi, G., Borghesi, S., Füssler, J., Jamieson, T., Wimberger, E., & Zhou, L. (2020). Emissions trading systems with different levels of environmental ambition: implications for linking - Report for the Carbon Market Policy Dialogue. Technical Report (LIFE DICET project), Florence School of Regulation, European University Institute, Florence.

Verra. (2021). The Future of the Voluntary Carbon Market, https://verra.org/the-future-of-the-voluntary-carbon-market/, last accessed 16 September 2021.

WOCAN. (2021). How the scaling of voluntary carbon markets can amplify gender equality impacts, https://www.wocan.org/sites/default/files/White%20Paper-%20W%2B%20carbon%20markets%20.pdf. Last accessed on the 15 September 2021.

Zetterberg, L. (2012). Linking the emissions trading systems in EU and California. Report B2061, IVL Swedish Environmental Research Institute.

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