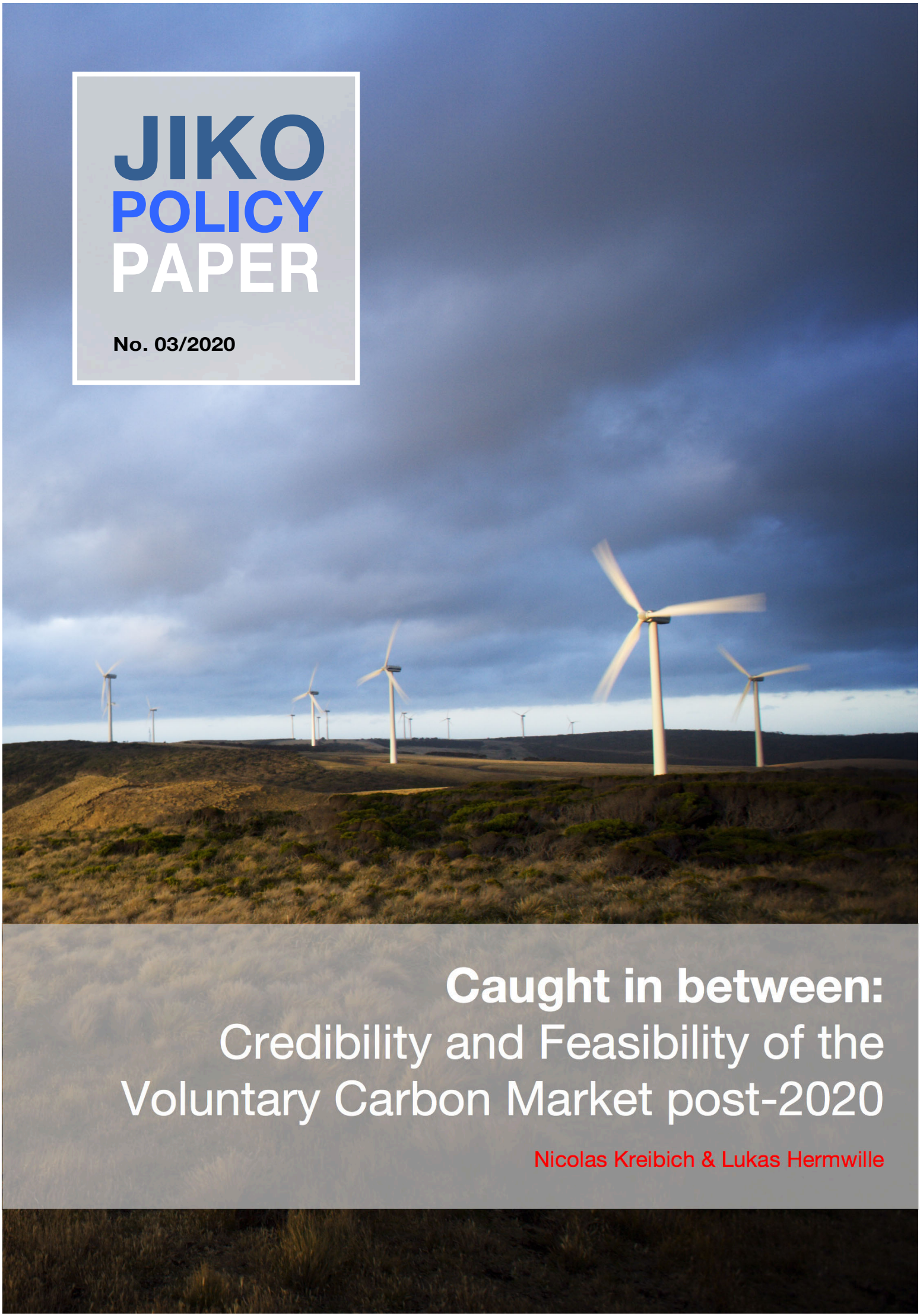

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Caught in between: Credibility and Feasibility of the Voluntary Carbon Market post-2020

Nicolas Kreibich & Lukas Hermwille

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Contents

Summary

The voluntary carbon market is on the rise and could grow to another order of magnitude due to strong demand from private companies that have committed to net-zero emissions. We assessed 134 major companies with annual turnover of more than one billion US-Dollar. Collectively, these companies account for more than 5.65 trillion US-Dollar in annual revenues and the vast majority of these companies have indicated to use offsets as a key component of their climate change mitigation strategy.

But can this large potential demand for voluntary carbon credits be met by sufficient supply? With the adoption of the Paris Agreement, the context of the voluntary carbon market has changed fundamentally and triggered a struggle of the main supply-side actors in dealing with these changes in order to reposition the voluntary carbon market. Their search for a place within the Paris Agreement's architecture is still ongoing. Each of the approaches currently under discussion has its own characteristics in terms of environmental integrity, practicality and marketability:

- **Non-NDC crediting**, i.e. crediting projects in the "uncapped environment" outside the scope of the host country's NDC without implementing corresponding adjustments, is severely limited in scope and considerable practical challenges persist. Moreover, taking into account the Pars Agreement's mandate on Parties to progress towards economy-wide NDCs (Art. 4.4 PA), there is no viable long-term perspective for this approach.
- **NDC support units**, i.e. labelling projects contributing to the achievement of a host country's NDC but cannot be used for compensation purposes, do not seem to be in demand. Establishing this new product on the market would require significant efforts with uncertain outcomes.
- **Non-compliance credits**, i.e. units that can be used to support neutrality claims but are not reflected through corresponding adjustments in the official emissions book keeping under the UNFCCC can undermine the legitimacy and environmental integrity of voluntary carbon markets potentially opening up a race to the bottom of competing standards. Not only is it questionable to what extend non-compliance credits can address financial or reputational risks of buyers, but it can also distort our perception of global collective action.
- **NDC crediting**, i.e. crediting projects within the host country's NDC with corresponding adjustments in the country's greenhouse gas accounting framework, should ensure a high degree of environmental integrity, but it is highly questionable whether host countries will actually be willing to implement the corresponding adjustments since it may make it harder for them to achieve their own NDCs.

None of the four approaches discussed is currently ready for implementation. But from the four options discussed above, NDC crediting with corresponding adjustments seems to be the only one that does not lead into an impasse. But it is by no means an easy option. Ultimately, its success will depend on a political question, namely: Will host countries be willing to make corresponding adjustments for voluntary offsets?

In this difficult situation, the voluntary carbon markets will need the support of public policy. First and foremost, policy makers need to enable the use of corresponding adjustments in the Art. 6 accounting framework. Secondly, they could provide political support, by e.g.

creating a club of "friends of the voluntary carbon market" in which countries commit to enable corresponding adjustments for voluntary market activities implemented on their own territories and work politically to convince other countries to join the club.

Meanwhile, voluntary carbon market actors can also further advance the NDC crediting approach by finding innovative ways to share the risk of overselling and therefore making it easier for host countries to accept corresponding adjustments. This can be achieved, for example, by issuing credits only after the successful (over)achievement of the host countries NDC in one period. But the voluntary carbon market should also explore more sophisticated approaches of sharing the overselling risk for example through appropriate insurance products or a security reserve pool to accommodate shortfalls.

Overall, our analysis highlights a big discrepancy between the seemingly gigantic potential demand for voluntary offsets and the ability of the established certification schemes to supply credits legitimately and in a way that supports the objectives of the Paris Agreement without undermining them.

1 Introduction

Since the adoption of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015, the number of major companies that have put forward pledges to achieve net zero emissions has been growing significantly.[1] The vast majority of companies pledging for neutrality seems to rely on some form of compensation of remaining emissions through offsetting. If the pledges translate into actual demand for voluntary carbon credits, the voluntary carbon markets could grow to another order of magnitude compared to current levels, at least in theory.

In practice, however, the voluntary carbon market is confronted with new challenges, particularly on the supply side. The Paris Agreement's universal sway and transformative ambition requires voluntary offset providers to think in new ways (Hermwille & Kreibich, 2016; Kreibich & Obergassel, 2019b). In this paper, we scrutinize the voluntary carbon markets' quest for new solutions that are compatible with the architecture of the Paris Agreement. We do so by tracing the discourse among key stakeholders in the voluntary carbon market, drawing on publications of the International Carbon Reduction and Offset Alliance (ICROA), the Voluntary Carbon Market Working Group (VCM-WG) as well as several individual operators of voluntary carbon crediting schemes.

In doing so, the paper builds upon a broad range of literature that discusses the changes introduced with the Paris Agreement and their political as well a technical consequences for the future operation of the carbon market (e.g. Kreibich & Hermwille, 2016; Schneider et al., 2017, 2019; Michaelowa et al., 2019; Obergassel et al., 2015). Our analysis goes beyond previous work by Blum and Lövbrand (2019), Blum (2020) and Lang et al. (2019), who more broadly discuss the legitimation of (voluntary) carbon markets after Paris, but do not provide a detailed account of voluntary market actors' positioning for finding a place for the voluntary carbon market within the architecture of the Paris Agreement that acknowledges the universal scope of the Agreement and ensures the overall integrity of climate action. Lastly, the paper brings together the perspectives of the demand and the supply side: By juxtaposing new numbers of the potential demand for voluntary offsets from large GHG emitting companies with the struggle on the supply side in dealing with the changed circumstances of the Paris Agreement, the paper discloses the entire spectrum (and tragedy) of the voluntary market's current situation.

Our research finds that the voluntary carbon market as a whole has still not found a way to align itself with the new legal architecture of the Paris Agreement in a credible and legitimate way, it seems to be caught in between credibility and feasibility. The growing mismatch between the hope placed in voluntary offsets by private sector companies relying on offsets to achieve their neutrality pledges and the continued quest for a common position of the main suppliers of the voluntary carbon market is cause for concern. There is a risk that the current discursive stalemate turns into a

[1] Some uncertainty remains about the nature of those pledges. In some instances they relate only to CO_2 emissions (carbon neutrality), others include all types of greenhouse gases (GHG neutrality) or even non-GHG effects such as radiative forcing effects of high altitude emissions in international aviation (climate neutrality) (Carrillo Pineda & Faria, 2019; Luhmann & Obergassel, 2020).

race to the bottom in which voluntary carbon markets undermine the objectives of the Paris Agreement instead of supporting the required transformational change.

The paper is structured as follows: Section 2 provides a summary of the current and future voluntary carbon market by summarizing the state of play as well as an outlook on future demand. Section 3 outlines the changed international context and explains the key challenges the voluntary carbon market is confronted with after the adoption of the Paris Agreement. Section 4 then traces the debate of how different voluntary market actors intend to address these challenges. Section 5 discusses the findings of the analysis provided in the previous section and concludes.

Box 1: The Voluntary Carbon Market

The term 'voluntary carbon market' is not clear cut and can relate to activities with different characteristics. In its most common usage, it refers to a situation in which individuals or organisations buy carbon credits issued by privately organized certification schemes to voluntarily reduce their carbon footprint for ethical reasons or reasons of corporate social responsibility.

In recent years, though, the lines between the compliance market and the voluntary carbon market become increasingly blurred. Private certification standards are also being used in compliance markets and voluntary buyers do also use internationally governed market standards for voluntary offsetting. Furthermore, the voluntary purchase of carbon credits is no longer limited to the private sector but also includes national and subnational public bodies. This makes a clear delimitation of both markets increasingly difficult (see also Kreibich & Obergassel, 2019b).

2 Current Status of the Voluntary Market

The global voluntary carbon market has been in turmoil for over a decade now. After some strong initial growth, both market volume and market value have been decreasing relatively steadily. This downward trend began with the global economic and financial crisis in 2008 and 2009. The failure of the Copenhagen climate negotiations to produce a new binding international climate treaty also affected the market in a negative way (Donofrio et al., 2019).

Even after the successful adoption of the Paris Agreement, the voluntary market did not make a speedy recovery. Instead, the downward trend continued. This may be explained with the continued uncertainty about the viability and legitimacy of voluntary offsetting under the new legal architecture (Hermwille & Kreibich, 2016, see also discussion below).

Only very recently, the outlook has changed. In 2018, the voluntary carbon market saw an increase in both market value and volume after six consecutive years of decline. Overall, voluntary credits representing 98.4 $MtCO_2e$ were traded in 2018 amounting to a cumulative market value of USD 295.7 Million (Donofrio et al., 2019). **Figure 1** below illustrates the development of the voluntary carbon market in the 2006-2018 period.

And this recent recovery of the voluntary carbon market may prove to be a lasting swing, because the outlook for demand for voluntary offsets is strong as more and more companies take on far-reaching mitigation commitments. The NewClimate Institute lists 14 subnational regions, more than 400 cities, and more than 800 private companies that have committed to achieve carbon or climate neutrality by 2050 or before (NewClimate Institute, 2020; see also WEF, 2019).

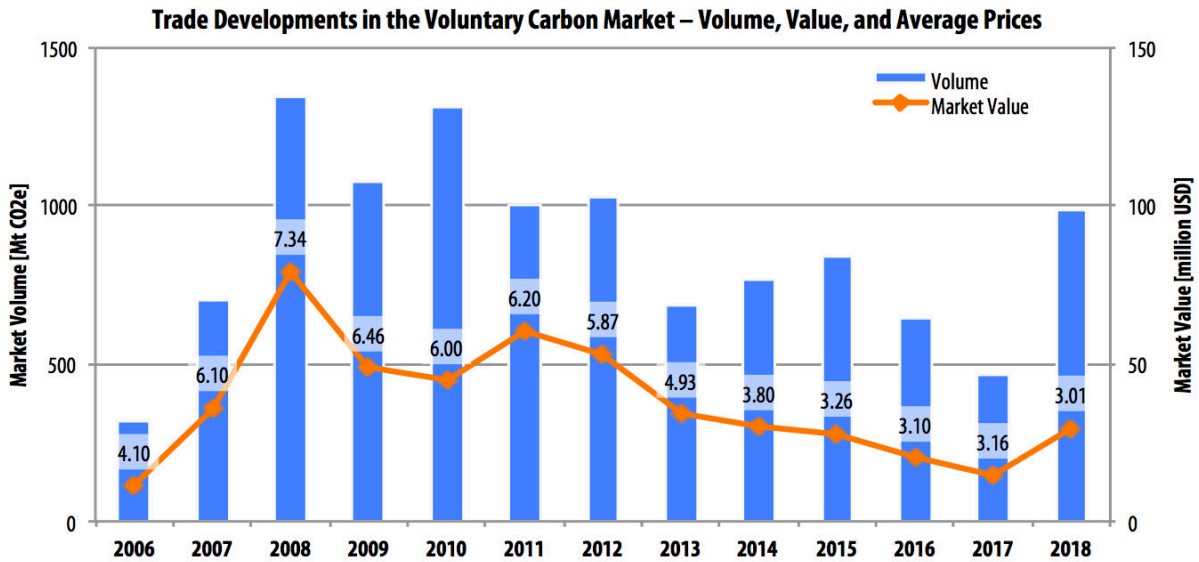

Figure 1: Trade developments in the voluntary carbon market for the 2006-2018 period.
Source: own illustration based on data from Donofrio et al. (2019)

Yet, the information available on the details of those commitments as well as specific information on the companies and their emissions remains scarce. We have therefore conducted additional research and collated a list of 139 large companies with annual turnover of more than one billion US-Dollar. The dataset was compiled building on existing databases by ECIU (2020), NewClimate Institute (2020) and the UNFCCC's NAZCA Platform (2020). Collectively, these companies account for an estimated annual turnover of more than 6.7 trillion US-Dollar substantially exceeding the gross domestic product (GDP) of Japan, the third largest economy in the world and nearly half the GDP of China (UN Data, 2020). Please note that given the scarcity of information available, we cannot guarantee that the list is comprehensive.

All companies we analysed have announced some form of neutrality target, but the targets differ in several ways: Some companies explicitly include all greenhouse gas emissions, whereas others focus on CO_2 emissions only. While most companies consider all direct and indirect emissions of their own operations (scope 1 and 2), some companies seek to work with their business partners and even include emissions that occur further up or down the supply chain and are beyond their direct control (scope 3). This latter aspect is particularly relevant for several companies of the financial industry, many of which have pledged to decarbonize their entire investment portfolios (UNEP Finance Initiative, 2020).

Finally, the pledges differ in their timing. While vast majority of the companies included in our dataset have a 2050 horizon for the neutrality commitments, some companies, including two of the largest companies in the list, Google and Microsoft, claim that they have already achieved carbon neutrality.

The most important difference with relation to this study is obviously whether the companies intend to use offsets to achieve their voluntary pledges. Only a small minority of eight companies have explicitly excluded the use of offsets. 62 companies with a combined annual turnover of 3.39 trillion US-Dollar explicitly intend to offset some remaining emissions. For the remaining 69 companies in our dataset the utilization of offsets remains unclear.

The dataset also includes companies from a very wide range of sectors (see **Figure 2** for a breakdown). For some of these sectors, it may be relatively easy to phase out greenhouse gas emissions, e.g. by procuring electricity from renewable energy sources and increasingly switching to electric mobility. This is for example the case for companies from the information and communication technology (ICT) industry, manufacturers of technological equipment and hardware or the financial industry. For these companies, the use of offsets might at most be an interim solution on their way to a full decarbonization of their own operations.

Meanwhile, the dataset also includes companies whose business model is much more strongly linked to GHG emissions, either because they feature very high GHG emissions per value added and have a still a very long path towards decarbonization, or because zero-emission alternatives are just not commercially available and in some cases not even technically feasible. Examples for the former case include energy industry companies such as Shell, BP or Repsol, mining giant Rio Tinto, or members of the chemical industry such as AkzoNobel. Examples for the latter group include companies from the steel industry (ArcelorMittal, Tata Steel Europe, ThyssenKrupp), cement industry (HeidelbergCement) and the aviation industry (EasyJet, Etihad, Iberia, International Airlines Group, and Qantas). For all of these companies, the use of offsets seems to be the only viable option to achieve carbon or climate neutrality from today's point of view.

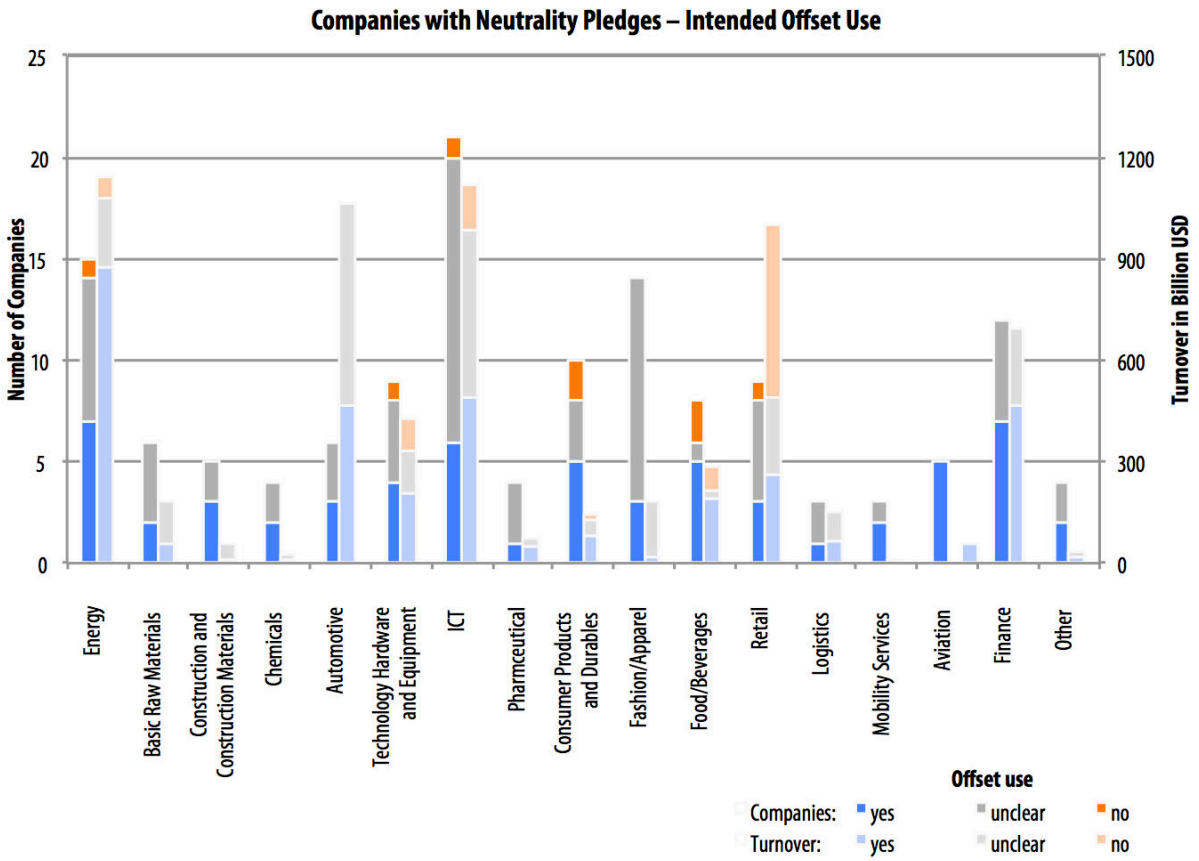

Figure 2: Number of companies with climate/carbon neutrality pledges, their collective annual revenue and their intended use of carbon offsets by industry. *Source: Own illustration building on data from ECIU (2020), NewClimate Institute (2020) and the UNFCCC's NAZCA Platform (2020).*

For the majority of the companies listed in our dataset, offsetting will be a key strategy for meeting their commitments. However, the use offsets has its own problems and limitations. In this regard, Carrillo Pineda and Faria (2019) propose guiding principles for company neutrality pledges. They inter alia suggest that achieving neutrality shall entail to fundamentally align the business model of a company with the pledge; the chosen transition pathway should be compatible with the well-below 2°C target; and it should be reflected in the company's long-term strategies signalling the viability of the carbon-neutral business model to investors and stakeholders. They posit that neutrality pledges that rely heavily on carbon offsets can hardly be consistent with a 1.5°C pathway. The only exemption is if carbon credits are sourced from carbon removal projects. However, as pointed out by Jeffery et al. (2020), these kinds of projects have their very own challenges including with respect to high uncertainty of the permanence of the removals.

With regard to the impact on long-term strategies and carbon-neutral business model, Carrillo Pineda and Faria (2019) conclude that there is only a limited effectiveness. This is mirrored by the analysis of Machnik et al. (2020), who have reviewed the climate pledges of 44 major European companies. They find that their commitments are still not aligned with the objectives of the Paris Agreement and that they are particularly weak in the short term indicating that major transformations are being postponed. Similarly, Tong and Trout (2020) survey major oil and gas companies and find that across the board they fail to meet minimum criteria such as stopping the exploration of new reserves for credible implementation of their climate pledges (see also Kachi et al., 2020).

#	Company	Country	Turnover [bn US$]	Industry	Target year	Off-setting
1	Walmart	USA	514.4	Retail	2040	no
2	Shell	NED	388.4	Energy	2050	yes
3	BP	GBR	303.7	Energy	2050	yes
4	Volkswagen	DEU	298.41	Automotive	2050	yes
5	Toyota	JPN	271	Automotive	2050	unclear
6	Apple	USA	260	ICT	2030	yes
7	Amazon	USA	232.9	Retail	2040	yes
8	Daimler	DEU	202.6	Automotive	2040	unclear
8	Allianz	DEU	156	Finance	2012	yes
10	Ford	USA	155.9	Automotive	2050	yes
11	Google	USA	136	ICT	2010	no
12	BMW	DEU	122.2	Automotive	2050	unclear
13	Axa Group	FRA	122	Finance	2050	unclear
14	Hewlett-Packard	USA	111	ICT	2050	unclear
15	Microsoft	USA	110	ICT	2015	yes
16	Nestlé	CHE	95	Food/Beverages	2050	yes
17	Siemens	DEU	94	Technology Hardware and Equipment	2030	no
18	Bank of America	USA	91	Finance	2020	yes
18	Bosch	DEU	88	Technology Hardware and Equipment	2020	yes
20	Aviva	GBR	87	Finance	2016	yes
21	Deutsche Telekom	DEU	83	ICT	2050	unclear
22	ENEL	ITA	80	Energy	2050	unclear
23	Tesco	GBR	79	Retail	2050	unclear
24	ENI	ITA	77	Energy	2030	yes
25	Sony	JPN	76	Technology Hardware and Equipment	2050	yes
26	Target	USA	75.4	Retail	2050	unclear
27	Panasonic	JPN	75	Technology Hardware and Equipment	2050	unclear
28	Facebook	USA	70.7	ICT	2030	yes
29	ArcelorMittal	LUX	70.6	Basic Raw Materials	2050	unclear
30	Deutsche Post	DEU	67	Logistics	2050	yes
31	Equinor	NOR	61	Energy	2050	no
32	Unilever	NED	58	Food/Beverages	2030	no
33	Telefónica	ESP	56.8	ICT	2050	unclear
34	Munich Re	DEU	54	Finance	2050	unclear
35	América Móvil	MEX	53	ICT	2050	unclear
36	Bayer	DEU	51	Pharmaceutical	2030	yes
37	BNP Paribas	FRA	48	Finance	2020	yes
38	Vodafone	GBR	48	ICT	2050	unclear
39	Orange	FRA	47.3	ICT	2050	unclear
40	Zurich Insurance	CHE	47	Finance	2014	yes
41	Novartis	CHE	47	Pharmceutical	2025	yes
42	Saint-Gobain	FRA	46	Construction and Construction Materials	2050	unclear
43	Deutsche Bahn	DEU	44	Logistics	2050	unclear
44	Best Buy	USA	43	Retail	2050	unclear
45	IKEA	NED	42	Consumer Products and Durables	2030	yes
46	Repsol	ESP	41	Energy	2050	yes
47	Rio Tinto	GBR	40.5	Basic Raw Materials	2050	unclear
48	CNP Assurances	FRA	39.5	Finance	2050	unclear
49	Centrica	GBR	39	Energy	2050	yes
50	Maersk	DNK	38.9	Logistics	2050	unclear

Table 1: List of the top 50 largest companies (by annual revenue) with climate or carbon neutrality commitments.
Source: Wuppertal Institute based on ECIU (2020), NewClimate Institute (2020) and the UNFCCC's NAZCA Platform (2020).

3 The Paris Agreement: A New Climate Policy Paradigm

The adoption of the Paris Agreement in 2015 was celebrated as an historic achievement of global climate governance. It fundamentally altered the context and the legal architecture under which voluntary carbon markets developed and which determine the boundaries of their operation. In this section, we briefly discuss some of the key features of the Paris Agreement and the changes they brought compared to the previous legal architecture under the Kyoto Protocol that have particular ramifications for voluntary carbon markets.

3.1 Transformative Ambition

The Paris Agreement recognizes that climate change is no longer an isolated environmental problem but constitutes a fundamental transformation challenge. Unabated climate change will transform our global economies and societies by a series of unprecedented disasters. The only alternative is to fundamentally transform our economies and societies towards sustainability (Hermwille, 2016; Kinley, 2017).

The transformational ambition of the Paris Agreement is implicit in its long-term objectives. The goal of limiting global warming to "well below 2 °C and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels" (Art. 2.1a, PA, UNFCCC, 2016a) not only represents a quantitative increase compared to the previous wording but also a re-interpreta- tion of the ultimate objective of the United Nations Framework Convention on Climate Change, to avoid dangerous climate change. The long-term goal of the Paris Agreement can only be understood one way: any further global warming is dangerous. It recognizes that the objective is not to gradually reduce emissions but to eradicate them altogether.

For voluntary carbon markets as much as for any other offsetting mechanism this bears the question what "additional" contribution these schemes can deliver when the benchmark for Nationally Determined Contributions (NDCs) is already to "reflect the highest possible ambition" (Art. 4.3, PA, UNFCCC, 2016a; see also Michaelowa et al., 2019). In any case, a legitimate use of offsetting under the Paris Agreement needs to contribute to host countries embarking on a transformational pathway. And it must not contribute to further entrench existing high-carbon path dependencies.

This may relate to individual mitigation activities that help to gradually reduce emissions in the short term but lock-in continued emissions for a long period. A drastic example for this would be the building of highly efficient coal power plants. While these may reduce emissions compared to current inefficient generation technologies, it would also cement the continued and unabated consumption of coal and the corresponding carbon emissions for the technical lifetime of the plant.

On the other hand, it calls into question the legitimation of the offsetting mechanism itself, if

the use of offsets serves as an excuse to continue high-carbon activities and reliefs the pressure for low-carbon innovation (see also Carrillo Pineda & Faria, 2019).

3.2 Universal Scope

One of the reasons for the enthusiastic reactions to the adoption of the Paris Agreement was that it did away with the static differentiation between developing and developed countries (Obergassel et al., 2015). The Paris Agreement requires all Parties to "prepare, communicate and maintain successive nationally determined contributions [and to] pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions" (Article 4.2, PA, UNFCCC, 2016b). This means that all Parties will pursue some type of mitigation activity. Most Parties have committed to some form of absolute, dynamic or relative limitation on the emissions of their economy or at least on some sectors thereof. At the same time, however, there is no legal obligation for Parties to achieve the mitigation targets adopted as part of their NDCs (Oberthür & Bodle, 2016).

This contrasts with the architecture of the Kyoto Protocol, where only Parties listed in Annex B of the protocol – mainly industrialised countries – had adopted legally binding mitigation targets, leaving a large part of the world unregulated, the so called 'uncapped environment'. In the past, this uncapped environment was the main source of supply of both the compliance and the voluntary carbon market. Countries without mitigation obligations were eager to attract carbon finance in low-carbon technologies from abroad and to benefit from sustainable development impacts achieved by the projects and programmes. Carbon finance was particularly attractive for these host countries as they could export the emission reductions achieved by these activities without having to account for the exports. This situation has fundamentally changed under the Paris Agreement: former host countries without mitigation commitments now face an obligation to develop and communicate NDCs which will cover large parts of their economy and implement respective policies. Therefore, the uncapped environment will be much smaller in size, and is set to become even smaller in the future as all Parties are supposed to move towards economy-wide NDCs, as envisaged by the Paris Agreement (Art. 4.4 PA, UNFCCC, 2016b).

3.3 Issues with Environmental Book Keeping

Mitigation activities implemented within the capped environment contribute (at least in theory) automatically towards the achievement of the host Party's NDC. The emission reductions generated by a mitigation activity would be claimed against the national target. If the same emission reductions are also claimed on the demand side by the investor of the mitigation activity, there would be double claiming. Depending on how the emission reductions are used on the demand side, this could raise problems of environmental integrity. If the emission reductions are used by another country for NDC attainment while the reductions are still reflected in the host country's inventory, double claiming would lead to a situation in which the emission reduction is counted twice (double counting), thereby undermining environmental integrity (Hood et al., 2014; Prag et al., 2013; Kreibich & Hermwille, 2016; Schneider et al., 2017, 2019). Hence, double claiming is a risk that leads to double counting if there is a common accounting system or interlinked accounting systems.

If, by contrast, emission reductions are used for non-compliance purposes, such as private entities claiming carbon neutrality, double claiming does not directly lead to double counting and

the environmental impacts can be expected to be more nuanced and indirect. Despite these different impacts, solutions to avoid double claiming have in the past been developed both within the compliance and the voluntary carbon market.

When Parties negotiated the Paris Agreement and created the possibility for Parties to cooperate in the achievement of their NDCs under Article 6, there was a common understanding that double counting of emission reductions must be avoided. Article 6.2 requires Parties to apply robust accounting when transferring internationally transferred mitigation outcomes (ITMOs) (Art. 6.2 PA UNFCCC, 2016b). Emission reductions from the Article 6.4 mechanism cannot be used "to demonstrate achievement of the host Party's [NDC] if used by another Party to demonstrate achievement of its [NDC]".

With the adoption of the Katowice climate package at COP24, Parties have partially operationalized the safeguards to prevent double counting under Article 6.2 (Kreibich & Obergassel, 2019a). The respective provision requires Parties to adjust their emissions balance on the basis of corresponding adjustments reflecting the ITMOs transferred and acquired (Decision 18/CMA.1 para 77d), UNFCCC, 2018). In order to further operationalize this provision, the global community is making considerable progress by developing solutions that could solve some of the technical challenges of ensuring robust accounting in light of the large diversity of Parties' NDCs (see e.g. Müller & Michaelowa, 2019; Schneider et al., 2020).

While becoming more salient under the Paris Agreement due to its universal scope, the double claiming risk is not new. Within the compliance markets established under Kyoto Protocol, a double claiming risk existed for mitigation activities implemented in countries that had adopted mitigation targets: Crediting activities hosted by Annex B countries that were registered under Joint Implementation (JI) could issue Emission Reduction Units (ERUs) for every abated tonne of CO_2e. In order to avoid double counting, the Kyoto Protocol required that Assigned Amount Units (AAUs) equivalent to the amount of ERUs exported to be subtracted from the host country's account (Foucherot et al., 2014; Kreibich & Obergassel, 2016) .

Under the Kyoto Protocol, the voluntary carbon market also gained experience in dealing with the double claiming risk. Private certification standards, however, adopted different approaches to address the risk. The most prolific voluntary carbon market standard, the VCS, followed the JI principle requiring an official document from the host country certifying that an amount of AAUs equivalent to the number of credits to be issued had been cancelled. Without such a corresponding cancellation, projects would not be eligible (VCS, 2012).

Under the Gold Standard, a desk-review is conducted to establish if there is a risk of double counting. If the review finds that there is a double counting risk, the project proponent must either demonstrate that this risk does not exist, it has been addressed externally, or it commits to cancel AAUs in lieu of the Gold Standard voluntary emission reductions to be issued (Gold Standard, 2015).

The CCB Standards require convincing proof that the issue of double counting has been avoided, while under the CarbonFix Standard the issue is resolved by negotiations on a case-by-case basis with the authorities during certification (see Foucherot et al., 2014).

So while the private certification standards of the voluntary carbon market used different approaches in dealing with the double claiming risk (Michaelowa et al., 2018), this can be seen as an indication of the consciousness among voluntary carbon market participants to address double claiming.

This allows to draw the following interim observations: Under the Kyoto Protocol, there was

a common understanding that double claiming is a risk that should be avoided, both under the compliance and the voluntary carbon market. Private certification standards have developed different approaches to deal with the issue and gained experience with their implementation.

With the adoption of the Paris Agreement, there is a general agreement that double claiming must be also be avoided in compliance markets. Technical solutions are being developed that will ensure double claiming under the Paris Agreement is avoided. Against this backdrop, we will now turn to the current discourse within the voluntary carbon market on how double claiming should be dealt with in the future.

4 In Search of Solutions: Tracing the Debate

This section provides an overview on how different voluntary market actors intend to deal with the double claiming issue and how their positions have evolved over time. We will first trace the debate within the voluntary carbon market community to then identify the predominant approaches promoted by key actors in the discussion.

While the voluntary carbon market is characterized by a lack of transparency and a large complexity, there seems to be a consolidation of offset providers and intermediaries (Donofrio et al., 2019). This consolidation together with the increased interconnectedness of organisations allows to identify key actors and trace predominant discursive patterns.

One key market actor is the International Carbon Reduction and Offset Alliance (ICROA), a network organisation comprising the largest offset providers and certification standards in the voluntary carbon market. ICROA is a programme within the International Emissions Trading Association (IETA), a lobby organisation promoting the role of carbon markets. Another key actor in this process is the Voluntary Carbon Market Working Group (VCM-WG), that was convened by the Gold Standard with the support of the German government, bringing together civil society organisations, carbon market actors from the private sector and private certification standards to reflect on the role and design of the voluntary carbon market post-2020.[2] For the analysis we considered the publications of both bodies as well as pertinent publications of their individual members published between late 2015 and 2020. In total, we analysed 12 policy documents and position papers. We complemented this with insights from the peer reviewed literature (inter alia: Lang et al., 2019; Blum, 2020; Blum & Lövbrand, 2019 as well as the literature cited therein) as well as from our own observations participating in several pertinent UNFCCC side events and expert workshops and webinars organized by ICROA.

As will be shown in the following, the debate can be broadly divided into six stages. It should be noted though, that these stages do not follow a strict chronological order but that there are overlaps between them.

Understanding the challenge

Soon after the adoption of the Paris Agreement in 2015, key voluntary carbon market participants realized the implications the new agreement with its global scope could have on their business models. Among the first was the Gold Standard, identifying the double counting risk as a "life-threatening challenge" for the voluntary carbon market (Gold Standard, 2017), a perception shared by several other market participants. In a survey by market observer Ecosystem Marketplace, double claiming and double counting are perceived as main risks for the voluntary markets post-2020 (Hamrick & Gallant, 2017; see also Hermwille & Kreibich, 2016).

[2] The Voluntary Carbon Market Working Group (VCM-WG) comprises WWF, The Nature Conservancy, World Resources Institute, CDP, Carbon Market Watch, ICROA, Gold Standard and Verra.

With the broader realization of this threat, thinking about alternative approaches kicked-off. Shifting from the mere offsetting logic towards assisting developing countries in achieving their NDC has been identified as one idea in the legitimation process (Blum, 2020). In this process, the Gold Standard suggested the development of "certified statements of emission reductions" as a new product that would certify a contribution to achieving the host country target but could not be used as offsets to support neutrality claims. Notably, these new statements are seen as an addition and not a substitute of carbon credits. The latter would still be issued on the basis of corresponding adjustments and could still be used for claiming carbon neutrality (Gold Standard, 2017).

Consolidation

In what could be described as a first phase of consolidation, ICROA published a guidance document providing an overview on the different approaches currently under discussion. The document makes a more nuanced differentiation between the possible solutions, clearly highlighting where corresponding adjustments are needed and what this could mean for carbon neutrality claims. The guidance document proposes three approaches:

- an NDC crediting model that would require the implementation of corresponding adjustments,
- a non-NDC crediting model where emission reductions are generated outside the scope of NDCs, and
- a financing emission reductions model where emission reductions would be owned by the host country

According to this guidance document, only the first two models could be used for carbon neutrality purposes, requiring emission reductions to be either achieved outside the scope of Parties' NDCs (non-NDC crediting) or accounted for through corresponding adjustments (NDC crediting model). The financing emission reductions model, by contrast, "would not allow non-state actors to make environmental claims, such as being carbon neutral. This is because the Party is receiving private sector assistance to achieve its climate goals, and that action does not create reductions beyond the target" (ICROA, 2017).

Disillusionment and emergence of new ideas

In 2018, the Gold Standard together with other organisations developed and tested a tool to assess the exposure of voluntary market projects to double claiming. The tool was to answer whether the emission reductions to be issued could also be captured under the host country NDC, thereby leading to double claiming. The findings of the test, which were summarized in a publicly available report (Gold Standard, 2018), clearly show that there are only very rare cases where it can be demonstrated that double counting is ruled out with certainty. The report also highlighted that it will be difficult to ensure that the host country will not account for the impact of the voluntary project in the future. This indicates that double claiming will be an issue for many, if not all projects (Gold Standard, 2018).

While the testing of the tool highlighted the practical challenges of the non-NDC crediting approach, political concerns about this approach had already been raised earlier. Numerous observers had highlighted the risk that non-NDC crediting could lead to disincentives for host countries to expand the scope of their NDCs (see e.g. Spalding-Fecher, 2017; Kreibich, 2018; Warnecke et al., 2018; Schneider & La Hoz Theuer, 2018). New accounting approaches emerged that called for emission reductions to be accounted for through corresponding adjustments even if generated outside the scope of an NDC (Japan, 2017; for an overview see: Schneider et al., 2020). While originating in the

context of the Article 6 rulebook, these discussions also found their way into the voluntary carbon market discourse (see: ICROA, 2017).

With this, the non-NDC crediting model significantly lost relevance in the discussion while the NDC support model gained more ground within the community. In a proposal for public consultation, VERRA – the organisation managing the VCS Standard – outlines the idea of creating Domestic Climate Contributions (DCCs) under their VCS Programme as a means to avoid the need for securing corresponding adjustments and developing double counting rules (VERRA, 2018).

The disillusionment regarding the operationalisation of the non-NDC crediting did, however, not lead to the emergence of a binary model with NDC support units being an alternative to carbon offset credits. Instead, the stakeholder discussions led by the Gold Standard produced a new approach consisting in the introduction of a new type of 'voluntary credit' that does not require the implementation of corresponding adjustments. This new credit type would presumably not be applicable to carbon neutrality claims in their current form, but instead require a change in the definition of carbon neutrality (Gold Standard, 2018). Clarity how carbon neutrality could be redefined is, however, lacking (Carrillo Pineda & Faria, 2019; Luhmann & Obergassel, 2020).

With this new approach, the clear distinction between credits certifying ownership of emission reduction that could be used for offsetting on the one hand and emission reductions statements indicating attribution of emission reductions to be used for claiming a financial contribution on the other was increasingly blurred. This paved the way for the emergence of new thinking around the need to address double claiming through corresponding adjustments.

Disclosure of diverging positions

The idea to issue voluntary carbon credits without having to implement corresponding adjustments and to have two voluntary market credit types was also taken up by VERRA in 2019. One reason for exploring this route was the feedback received from stakeholders, who feared difficulties of introducing emission reductions statements as a new product to the market (VERRA, 2019). These concerns are shared by numerous players in the market, who highlight that it had taken more than a decade to establish the concepts of offsetting and carbon neutrality with corporate investors having made considerable efforts to promote and communicate this concept – both within and outside their companies. For many investors, carbon neutrality is one of the main reasons to engage in the voluntary carbon market and only some specific buyers could be interested in an alternative to carbon offsetting (Kreibich & Obergassel, 2019b).

Given these challenges, VERRA put its financing emission reductions model (the DCCs proposal) on hold and instead started thinking about introducing a new compliance unit (VCU+). While an existing credit "would remain a purely voluntary unit as it always has" (VERRA, 2019), a VCU+ would comply with any requirements of future compliance regimes, such as CORSIA, including corresponding adjustments. This implies that conventional voluntary credits would not require corresponding adjustments to be implemented. If adopted, VCS would clearly deviate from the existing practice of addressing double claiming (see section 3.3 above for the VCS accounting provisions under the Kyoto Protocol). However, VERRA underscores that the use of voluntary credits for specific claims by corporate users is still under discussion and that thinking on this concept is early and ongoing (VERRA, 2019).

The idea to establish two voluntary carbon market credit types – one for compliance use

and one for purely voluntary use – continued to dominate the debate among voluntary carbon market players also finding its way into a broader consultation process supported by the German government. In June 2019, the Voluntary Carbon Market Working Group (VCM-WG) published a first statement for consultation with the broader community. The statement, which was explicitly not labelled as a formal position of the individual members of the group, differentiates between voluntary credits for compliance use and purely voluntary credits, putting the focus on the latter. For these credits the statement proposes to retain the infrastructure of the voluntary carbon market – including the issuance of carbon credits – while at the same time avoiding the need to implement corresponding adjustments. While the document puts the financial claim at its centre, it does not explicitly rule-out the possibility for these voluntary credits to be used for offsetting and carbon neutrality claims, but instead indicates that claims would have to be reviewed and potentially adjusted at a later stage (VCM-WG, 2019c).

The document was presented in a public webinar (VCM-WG, 2019b) and written feedback from stakeholders was sought in a public consultation process. The feedback provided by stakeholders displays a large diversity of views (VCM-WG, 2019a). While some respondents by and large support the statement, others have voiced criticism, in particular regarding the financial claim proposed by the document. Several organisations called into question the incentive structure of this model, asking why companies would engage on the voluntary market if they cannot offset their residual emissions. This is most explicitly reflected in a statement by WWF & Swiss COOP: "we are only active in the VCM because we want to offset certain emissions from our own business activities" (WWF & Swiss COOP in VCM-WG, 2019a).

In light of the continued relevance of offsetting, some organisations criticised the fact that the approach put forward by the VCM-WG does not explicitly rule-out offsetting (Government Europe 1, atmosfair) and that the document does not answer the question of which claims investors can make (Zeromission) (atmosfair, 2019; VCM-WG, 2019a). On the other side of the spectrum, some organisations called for the document to more explicitly allow for double claiming. This perspective is expressed most clearly by I4CE, who "think that the statement's clarity could still be improved on double counting, clearly saying that double counting between one country and one organization/person is necessary and doesn't affect environmental integrity" (I4CE in VCM-WG, 2019a).

Following the debate among voluntary market participants, the VCM-WG statement was updated (2019d). The updated version acknowledges that the applicability of the foundational claim put forward will be limited since the predominant use of the voluntary carbon market is currently for offsetting. Furthermore, the working group announced that it will explore "what further provisions the credits may require in order to be used in the context of offsetting" (VCM-WG, 2019d). Thus, while the document itself was ambiguous regarding how to deal with double claiming, it nurtured the discussion within the community showing that some organisations are clearly opposing any type of double claiming while others think that double claiming should be allowed.

	Non-NDC crediting	NDC crediting	NDC support	Non-compliance crediting
Key characteristics	Offsetting credit generated outside the scope of host Party's NDC.	Offsetting credit generated within an NDC that is accounted for through corresponding adjustments.	Unit generated within an NDC that cannot be used for offsetting.	(Offsetting) credit generated within an NDC that is not accounted for.
Is a credit issued?	Yes	Yes	No	Yes
Are emission reductions transferred?	Yes	Yes	No	No
Is ownership transferred?	Yes	Yes	No	No
Are corresponding adjustments required?	No	Yes	No	No
Can the unit be used for offsetting / carbon neutrality claims?	Yes	Yes	No	Depends on model: *Unclear: (Gold Standard 2018), (VCM-WG 2019) (VERRA 2019).* *Yes: (ICROA 2019)*
Can the unit be used for claiming a contribution to climate finance?	Yes	Yes	Yes	Yes
Contribution to host country NDC?	No	No	Yes	Yes
Specific models	Carbon credits (Gold Standard 2017) Non-NDC crediting (ICROA 2017) Non-NDC crediting (Gold Standard 2018) Non-NDC crediting (VCM-WG 2020)	Carbon credits (Gold Standard 2017) NDC crediting (ICROA 2017) NDC accounting adjustments (Gold Standard 2018) VCU+ (VERRA 2019) Compliance carbon credits* (ICROA 2019)	Emission Reductions Statements (Gold Standard 2017, 2018) Financing emission reductions (ICROA 2017, VCM-WG 2020) Domestic Climate Contributions (VERRA 2018) Non-compensatory uses (Gold Standard 2020)	Adjusting the nature of VERs (Gold Standard 2018) Voluntary VCU (VERRA 2019) Foundational financial claim (VCM-WG 2019) Carbon credits (ICROA 2019, 2020) Business as usual (VCM-WG 2020)

Table 2: Overview of main approaches currently under discussion. As can be seen, the "non-compliance credits" approach combines characteristics of two other approaches.
** Please note: The term "compliance* carbon *credits" has been included by the authors to delimit this approach from non-compliance crediting and is not the terminology used by ICROA (2019). Source: compilation by Wuppertal Institute*

Cutting corners

Allowing for double claiming within the voluntary carbon market is also the position included in ICROA's position paper from July 2019. With this document, ICROA abandons positions included in its earlier guidance document from 2017. While also differentiating between emission reductions for compliance purposes and voluntary carbon credits, ICROA argues in favour of the latter being used to make carbon neutrality claims even without corresponding adjustments having been implemented. One of ICROA's key arguments why the integrity of voluntary action and carbon neutrality claims under the Paris Agreement is maintained without corresponding adjustments is that emission

reductions are only counted once at the UN level: emission reductions are not exported from the host country to the jurisdiction in which the corporate buyer is based and only the host country reports the reductions to the UNFCCC, while corporate GHG accounts are not reported and aggregated to a country level. Another argument put forward is additionality: third Party standards ensure that emission reductions are over-and-above business-as-usual and regulatory requirements. However, the determination of additionality under the new legal architecture of the Paris Agreement with its universal scope and obligations by all Parties to develop and communicate increasingly more ambitious NDCs that "reflect its highest possible ambition" (UNFCCC, 2016a, Art. 4.3) comes with its own unresolved challenges (Michaelowa et al., 2019).

In its recently published position paper, ICROA reiterates and reinforces its previous position not to require corresponding adjustments in the context of the voluntary use of carbon markets. The paper builds on ICROA's previous argument that the emission reductions used for non-compliance purposes are only recorded once at the UNFCCC level and can therefore not lead to double counting, which allows to preserve the integrity of the voluntary carbon market without requiring corresponding adjustments. The paper reinforces this argument by showing that double claiming is already happening today in jurisdictions where unregulated corporates voluntarily reduce their emissions to achieve a voluntary climate target, such as a Science-Based Target. The emission reductions generated by the voluntary action will not only be claimed by the corporate to meet its voluntary target but also by the government where the corporate is based, as the reductions will be reflected in its inventory and hence reported to the UNFCCC. According to ICROA, this situation is comparable to double claiming within the voluntary carbon market. ICROA further highlights that requiring corresponding adjustments for voluntary market activities would distort the accounting system of the Paris Agreement, as the reported emissions would lie above actual emissions. In light of these observations, ICROA calls for corresponding adjustments not be mandatory (ICROA, 2020).

Finding common ground

Discussions within and between organisations are ongoing. The latest statement by the Voluntary Carbon Market Working Group published in May 2020 reflects the latest status of the debate and brings together the diverse approaches discussed over the last years:

- non-NDC crediting,
- NDC crediting, now renamed corresponding adjustment model,
- NDC support, now called financing emission reductions model, and
- non-compliance crediting, discussed as 'business as usual model'

The primary focus of the paper is the question of whether double claiming in the voluntary market could adversely impact climate ambition.

In this paper, the working group distances itself from the first version of its 2019 statement that left open whether credits without corresponding adjustments could be used for offsetting and claiming carbon neutrality. In stark contrast to this earlier statement, the latest paper highlights risks associated to crediting without corresponding adjustments and differentiates double claiming in the carbon market from other forms of 'double reporting'. Notably and in stark contrast to ICROA's position paper, the VCM-WG highlights that "there is a key difference between [these types of double reporting] and the carbon market in that they do not represent double claiming at a 'target' level and do not make claims that the impact being driven by the action is 'additional' to the efforts at

country level" (VCM-WG, 2020). The paper however highlights that there is no agreement within the working group and among stakeholders.[3]

The VCM-WG paper finally outlines a transition towards a future voluntary carbon market in which corresponding adjustments are required for credits used for offsetting and which operates in parallel to a financing emission reductions model. Hence, while alternative options of non-NDC crediting and the non-compliance crediting (business as usual) are not explicitly ruled out, the paper highlights their risks and there seems to be a movement towards requiring corresponding adjustments for offsetting through the voluntary carbon market.

This vision of a future that differentiates between two claims is made more explicit in the latest Gold Standard document published in June 2020 for consultation. In this document, the Gold Standard promotes a differentiation between 'Beyond' Paris-compliance units for use in offsetting claims and units for other uses that have non-compensatory benefits. This positioning builds on the view that "without Corresponding Adjustments, it is difficult to be certain there is no double claiming" (Gold Standard, 2020).

[3] According to the VCM-WG, three groups can be differentiated: (1) a group calling for corresponding adjustments being required for all internationally transferred credits, (2) a group supporting the transition towards corresponding adjustments, and (3) those maintaining that double claiming is not an issue and therefore advocate for the continuation of 'business as usual'.

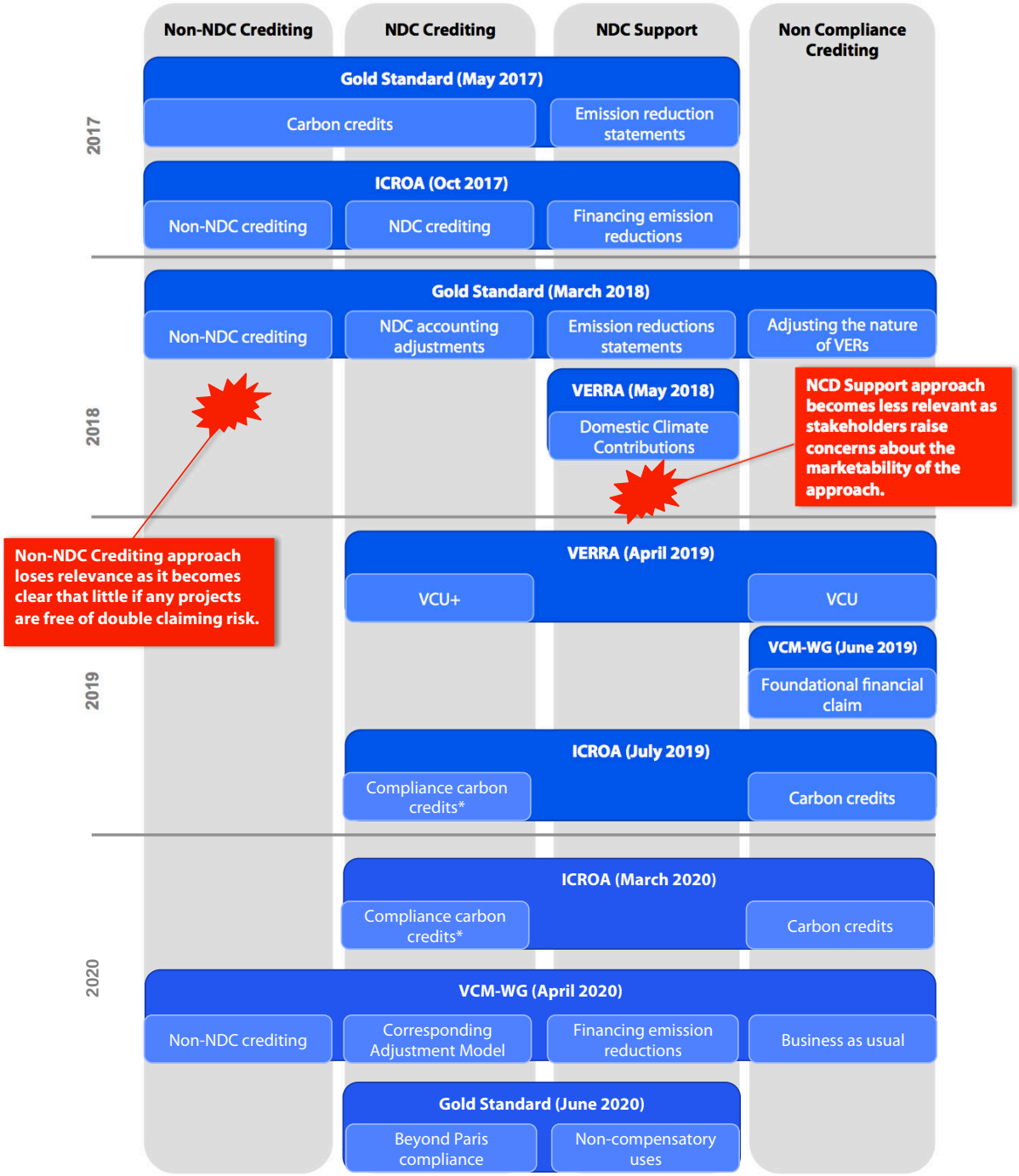

Figure 3: Role of individual approaches in the evolution of the discourse on the future of the voluntary carbon market. As can be seen, the non-NDC crediting approach and the NDC support approach became less relevant while non-compliance crediting emerged as a new approach in the course of 2018.
**Please note: The term "compliance carbon credits" has been included by the authors to delimit this approach from non-compliance crediting and is not the terminology used by ICROA (2019).*

5 Discussion and Conclusions

In this paper, we have outlined how the context of the voluntary carbon market has changed with the adoption of the Paris Agreement and we have traced the struggle of the main actors in dealing with these changes in order to reposition the voluntary carbon market.

Using offsets to support host countries' mitigation strategies

A first aspect discussed in section 3.1 above is the transformative ambition of the Paris Agreement. The first question to be discussed here is whether or not voluntary carbon markets can support this ambition. On the supply side, this question needs to be answered at the activity level. Clearly, just going beyond business as usual can no longer be a threshold for additionality demonstration. But this holds for any kind of offsetting scheme, whether that is a UN-governed compliance mechanism or the voluntary carbon market (Michaelowa et al., 2019). Private certification standards will have to align the implementation rules for offset generation and introduce new elements such as dynamic baselines or shortened crediting periods that take into account the dynamic evolution of climate policy.

Strengthening the link between companies' internal climate action and offset use

More pertinent is the question whether voluntary carbon offsetting can support transformative ambitions on the demand side at the companies that purchase the offsets. The analysis in section 2 shows that there is a growing interest among the private sector to become carbon neutral: 132 companies accounting for an estimated annual turnover of nearly 5.2 trillion US-Dollar that exceeds the gross domestic product (GDP) of Japan (UN Data, 2020) have adopted some kind of neutrality target. While these numbers are impressive and might indicate the emergence of an unprecedented future demand for offset credits, the role of credits within corporate climate strategies should be observed cautiously. While the rising consciousness about climate change and the emergence of corporate mitigation strategies is to be welcomed, a situation must be avoided in which companies use voluntary carbon offsetting as an "easy" way out of their responsibility to act on climate change. However, there seems to be little what the providers of voluntary credits can do to nudge their customers.

One idea that has been proposed in this context is to make the use of voluntary offsets conditional on the adoption of science-based targets for the respective company. However, it does not seem plausible that this can effectively be enforced by the certification schemes alone. Instead, a collaboration between major private certification schemes and corporate climate action initiatives seem promising in this regard, such as the cooperation between Gold Standard and the Science-Based Targets initiative that has already been initiated (Gold Standard, 2020). Such a collaboration could be supported by large voluntary offset credit suppliers who are in direct contact with the companies using offsets and often also offer sustainability consultancy services. In order to avoid any conflicts of interest, the operation and governance of such a new certification standard or label would

have to delinked from credit suppliers' and the voluntary certification standard's business operations.

There is no easy technical fix to solve the double claiming challenges

The second major issue to be discussed is whether voluntary carbon markets have found their place within the architecture of the Paris Agreement, a place that acknowledges the universal scope of the Agreement and ensures the overall integrity of climate action. The analysis of the debate within the voluntary carbon market shows that different approaches for dealing with the double claiming issue have emerged, each of them having its own characteristics in terms of environmental integrity, practicality and marketability. And none of them provides a straight-forward solution.

Non-NDC crediting, i.e. crediting projects in the "uncapped environment" outside the scope of the host country's NDC without implementing corresponding adjustments, might sound theoretically appealing. After all, one key reason for countries not to include certain parts of the economy in their NDC is because there might be significant uncertainties about the actual emissions and the potential to mitigate in that area of economic activity. In this situation, voluntary carbon markets could play a role as trailblazer and experiment with mitigation activities. With the insights generated in projects of voluntary carbon market it might be more feasible for countries to include the corresponding sectors in subsequent NDCs.

On the other hand, concerns have been raised that the non-NDC crediting approach might create perverse incentives in the opposite direction. Host countries might hesitate to expand their NDC scope in order not to threaten revenues from a prosperous voluntary carbon market.

Yet, in practice, this approach is severely limited in scope, with the share of global GHG emissions not falling within the scope of NDCs in 2030 being estimated to range between 12 and 14% (Fransen et al., 2017; Schneider et al., 2017). Moreover, there are considerable practical challenges that raise doubts. As discussed above, it appears to be challenging to clearly establish what is inside or outside both the current NDC- because in many cases the information provided in the NDCs is insufficient to draw clear boundaries, as well as in future NDCs (Gold Standard, 2018; Schneider et al., 2020).

Most importantly, though, the Non-NDC crediting approach is incommensurate with the ambition of the Paris Agreement, at least in the long run. Art. 4.4 of the Paris Agreement stipulates that Parties are "encouraged to move over time towards economy-wide emission reduction or limitation targets". If we take this aspect of the Paris Agreement's ambition mechanism seriously, the already limited scope will be diminished further.

NDC support units that provide a label for projects that contribute to the achievement of a host country's NDC but cannot be used for compensation purposes do not seem to be in demand. Establishing this new product on the market would require significant (and joint) efforts from all market participants – a process that could take years and yet lead to an unforeseeable outcome. Essentially, it would constitute a form of private results-based climate finance. There might be a niche market for such products. The approach could be particularly appealing for larger companies operating at global level as well as for corporates and individuals who want to make a positive contribution to the climate cause but that have in the past refrained from using offsets due to the reputational concerns associated to offsetting (Kreibich & Obergassel, 2019b). NDC support units could be particularly interesting for companies that sell a product that is closely linked

to its country of origin, such as coffee. The approach could allow these companies to market their product not only as fair trade and organic but also as "climate fair". However, as these units must not be used for neutrality claims, this potential new market can by definition not meet the demands from companies trying to meet their net-zero commitments.

Non-compliance credits, i.e. units that can be used to support neutrality claims but are not reflected through corresponding adjustments in the official emissions book keeping under the UNFCCC face serious legitimacy and environmental integrity concerns. The voluntary carbon market is not a form of charity. Buyers expect a high degree of credibility from offset providers. They purchase voluntary credits to manage their environmental reputation. Doubts about the integrity of the supplied units will therefore directly translate into a serious reputational and ultimately also financial risk for companies that intend to use those units to meet their net-zero commitments.

The massive prospective demand for voluntary offsets could induce a gold fever of project developers. Opening up the voluntary carbon markets to non-compliance units that are not in any way linked to the universal accounting structure of the Paris Agreement may set off a race to the bottom of competing offset providers. In that case, the voluntary carbon market could turn the good intentions of companies pledging carbon neutrality into bad outcomes for the global climate.

Finally, **NDC crediting with corresponding adjustments** seems to be the only solution that is practically feasible and at the same time compatible with the principles of the Paris Agreement ensuring a high degree of environmental integrity. Whether it will be feasible for the voluntary carbon market is not a technical question, but a political one. Will host countries actually be willing to implement the corresponding adjustments also for voluntary carbon units? Even taking into account the benefits of investments in projects triggered by the voluntary carbon market, implementing corresponding adjustments creates a risk of overselling, i.e. host countries transfer so many carbon units, that they are unable to meet their own NDC (Spalding-Fecher et al., 2020).

Based on our analysis we concur that NDC crediting with corresponding adjustments is by no means an easy route for the voluntary carbon market, but it seems to be the only one that does not lead into an impasse.

Political support for the voluntary carbon market?

The challenges with the NDC crediting approach are largely political and cannot be resolved by the voluntary carbon market on its own. There is a need for support through public policy to assist the implementation of the approach. At the international level, policymakers will have to make sure that the accounting framework for Article 6 enables corresponding adjustments for voluntary purposes and that it can easily used by the countries hosting voluntary market activities.

Furthermore, bilateral policy activities could assist the voluntary market in dealing with the expected difficulties in obtaining a permission from host countries to export emission reductions backed by corresponding adjustments. One possible solution in dealing with this problem could be bilateral agreements between host countries and those countries where the buyer of the offset credit is based.

While such an architecture has its precursors under the Kyoto Protocol in the form of signing Memoranda of Understanding, the context of the Paris Agreement raises new questions: What could host countries be offered in exchange for such an agreement, since these exports might make NDC attainment more difficult? How would acquiring company's

government benefit from an agreement that will lead to emission reductions (and their non-climate benefits) being achieved elsewhere? Furthermore, the lines between host countries and investor countries are also more blurred due to the universal scope of the Paris Agreement and future investors might be based in countries that have traditionally engaged on the voluntary carbon market as host countries including emerging economies.

A pragmatic way forward could be a political club of "friends of the voluntary carbon market" in which countries commit to enable corresponding adjustments for voluntary market activities implemented on their own territories and work politically to convince other countries to join the club. In this context, domestic offsetting programmes that would not require corresponding adjustments from another country since the units would not be traded internationally (see e.g. Nett & Wolters, 2017) could be an interesting option to build bridges for the voluntary carbon market for an interim period as long as the technical issues of implementing corresponding adjustment remain unresolved.

Sharing the overselling risks

While the NDC crediting approach requires political support from potential host countries, project developers and offset providers are not altogether incapacitated to further advance the approach. Voluntary market actors should first agree on making corresponding adjustments a requirement for the issuance of all credits, irrespective of their origin. Once this political decision has been taken, private certification standards, carbon credit suppliers and other voluntary market representatives can join forces and develop innovative solutions that make it easier for host countries to commit to making corresponding adjustments.

A straightforward way of doing so would be to issue voluntary credits only retroactively after the conclusion of the NDC period and on the condition that the host country has (over)achieved its NDC. Of course, this would pose a considerable risk for project developers and investors. But there might also be advanced solutions involving some form of insurance or pool reserve to share the risk of overselling between host countries and project developers.

In practice, this would mean that from the point of view of a project developer it might be much more attractive to invest in a country where she is confident that NDC implementation will actually match NDC ambition. Of course, this does not necessarily mean that investments will only happen in particularly ambitious countries. Such a scheme might also direct investments towards countries were low ambition is met by weak implementation of climate action. But this is not necessarily a bad thing. In such a case, at least the voluntary carbon market would invest in climate action. A prosperous voluntary carbon market might then actually trigger more ambition on the part of the host country in subsequent NDC periods.

Standing at a crossroads looking into opposite directions

Overall, our analysis highlights a big discrepancy between the seemingly gigantic potential demand for voluntary offsets and the ability of the established certification schemes to supply credits legitimately and in a way that supports the objectives of the Paris Agreement without undermining them. The voluntary market stands at a crossroads and the ongoing debate has disclosed that the main actors are still standing divided.

Discussions are ongoing and new initiatives, such as the Taskforce on Scaling Voluntary Carbon Markets (2020) and the public consultation recently launched by VERRA (2020) could contribute to finding a common position among key voluntary carbon market players. If, however, the main actors in the voluntary carbon

market do not unite behind an approach based on corresponding adjustments, they risk to lose track altogether. If they fail to get the required political support, the voluntary carbon market may become obsolete or worse, a threat to effective climate change mitigation.

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