International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:08, Issue:06 "June 2023"

A POTHOLED RACE TO NET ZERO

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DOI: 10.46609/IJSSER.2023.v08i06.027 URL: https://doi.org/10.46609/IJSSER.2023.v08i06.027

Received: 7 June 2023 / Accepted: 17 June 2023 / Published: 30 June 2023

Introduction

In 1920 Arthur Pigou introduced the concept of externalities in his book "The Economics of Welfare"[1] as those costs and benefits that are imposed on society but are not addressed by the pricing system of a free economy. (Pigou, 1920)The pricing system is an extraordinarily powerful concept that automatically regulates behaviour and action to ensure the best use of resources. Externalities, however, cause the pricing system to break down and Pigou argued that it was the State's responsibility to intervene with a "Pigovian tax" on individuals or businesses that create adverse effects on society.

The epicenter of today's fight for a sustainable planet revolves around managing greenhouse gas emissions (GHGs) through a myriad of levies and Pigovian taxes that differ by country and regulator. The regulated carbon markets revolve around Carbon Taxes and Emission Trading Schemes (ETSs) like the EU ETS. These instruments have existed since 2005 and have matured to a point where there are today 68 operating carbon tax and ETS schemes[2]. Independently, a large voluntary carbon market has evolved where companies, high net worth individuals and non-government organizations have announced their intents to race towards "Zero" (an intent to migrate their businesses towards being carbon neutral). (The World Bank, 2022) The voluntary market is the subject matter of much dispute on issues such as integrity, additionality, and permanence. The current paper seeks to capture the key trends in carbon pricing and the debate around the voluntary carbon market. It goes on to argue that despite the concerns, industry should support a strong voluntary market that has created increasing amounts of funds and liquidity for GHG reduction and removal efforts. The argument is important given that the voluntary market currently is currently going through a phase of self-reflection.

A Tipping Point

Evidence is increasingly pointing to a tipping point in climate change. Data indicates that the last year when the average surface temperature of earth was less than the twentieth century average

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was 1977, forty-five years ago[3]. (NOAA National Center for Environmental Information, 2021) The ten warmest years on record since 1800 to 2021 all occurred post 2010,evidentially making clear that the earth is getting materially warmer. The Paris Agreement, an international treaty on climate change was adopted by 196 Parties at COP 21 in 2015. The agreement commits to limiting global warming to 2ºC – preferably 1.5ºC in comparison to pre-industrial levels. This was the first time 196 nations pulled together a binding agreement on limiting climate change. There have been wide ranging concerns on setting a 2ºC target. Scientists believe that having crossed a 1.1ºC line so far in any case puts us across the tipping point. Armstrong Mckay et al[4] identify sixteen elements that contribute significantly to human welfare and to the earth ecosystem. A few of these - the collapse of Greenland Ice Sheet, the West Antarctic Ice Sheet collapse, low latitude coral reef die offs and the Boreal Permafrost abrupt thaw– having already occurred are indications that we are running out of time.(Armstrong McKay et al, 2022)

Carbon Credits: The Voluntary Carbon Market (VCM)

The origin of carbon crediting emerged in 1980 when the concept of swapping the debt of less developed countries to protect biodiversity was mooted. This "debt for nature" concept evolved with the Kyoto protocol which aimed to create a compensation mechanism by which developed countries who had profited through carbon intensive growth could compensate less developed countries who were impacted by carbon restrictions.

Carbon credits have come a long way since then and, as of September 2022, the UNFCCC's "Race to Zero" initiative had 8,307 companies, 595 financial institutions, 1,136 cities, 52 states and regions, 1,125 educational institutions and 65 healthcare institutions sign up. Many of these entities now actively track their carbon footprint and purchase carbon credits as a key part of their commitment to Net Zero emissions. The voluntary carbon credit market peaked in 2020 and 2021 with cumulative total sales in the voluntary market crossing$8 Bn by the end of 2021, with 2021 itself recording a sale of nearly $2 Bn. The price per ton of carbon reached $4 for the first time in 2021.BCG estimates that in 2021, buyers transacted carbon credits for 500mtCo_2, and that by 2030, the global demand for carbon credits could reach up to 1.5 gigatons of carbon dioxide ($GtCO_2$)[5]. (Shell and BCG, 2023)

The VCM currently functions in an unregulated manner through a variety of accrediting agencies. The leading issuers of carbon credits are Gold Standard (GS), and Verified Carbon Standard (VCS). These agencies evaluate projects, measure them for induction into their programmes and then register them. Credit issuances occur annually when the projects are operational. Ecosystem Marketplace[6] has estimated that as of date there exist as many as 170 types of carbon credits – differentiated by the activities that generate them.(Ecosystem Marketplace, 2022) .

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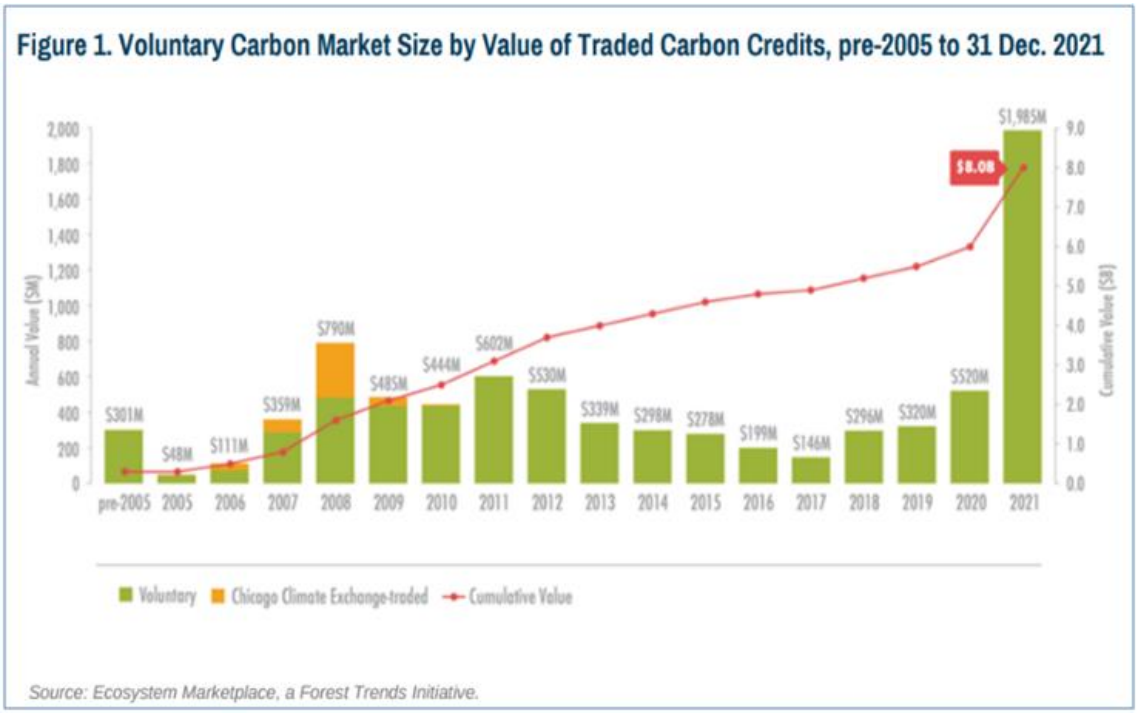

Source: Ecosystem Marketplace[6]

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Pricing data from S&P Global Platts reveals that carbon credits that have been sourced from removal and nature-based projects have had a significant price premium over reduction projects. At their simplest carbon removal projects (those that pull oxygen out of the atmosphere) are reforestation initiatives, and at their most complicated, they involve carbon capture and chemical weathering through minerals that dissolve atmospheric oxygen. Removal projects tend to be long gestation and fewer in number. As opposed to this, reduction/avoidance projects (those that prevent or lower GHG emissions) are represented by wind farms and energy efficiency projects. Avoidance projects tend to have shorter gestation. The short supply of removal projects has resulted in reduction projects having a traded volume 21 times that of removal projects.

The unregulated nature of the VCM over the past decade has allowed the market to grow exponentially. Independent accrediting agencies have established themselves and grown through word of mouth. Numerous projects have been able to register themselves and raise project returns. These incremental funds have become available for further deployment into removal and reduction programmes. Additionally, many entities have been able to give expression to their carbon neutral aspirations. These buyers have been able to purchase credits and display this intent to their customers, shareholders, and other stakeholders. In 2021, the voluntary market transacted 500 $mtCO_2$. While this was materially below the 15 $GtCO_2$ traded by the compliance market, the impact is significant[5]. (Shell and BCG, 2023)

Integrity and Quality

A frequently cited example on the damage the voluntary market could be inflicting is that of the current trend of companies advertising carbon positive imagery of their products. An example would be a carton of milk in the grocery store stating that it is “carbon positive” milk. The buyer of the milk has no way of understanding what the seller is doing to create such a claim and if indeed he is doing so, to what extent is this mitigating his carbon footprint? Another example is the case of Deutsche Post DHL, which offers carbon neutral deliveries but less than 1% of the company’s emissions were offset in 2020[2]. (The World Bank, 2022) The core criticism of the VCM has stemmed from such misuse. Naysayers believe that the voluntary carbon market is creating a framework for large emitters to continue with business-as-usual while “greenwashing” the public perception of their business. On the supply side, criticism stems from the fact that, at present, there is no clear definition as to what constitutes a high-quality carbon credit. Different accreditors use different principles and there is no way for a corporate that wants to buy a credit to know where the quality differences amongst credits lie.

Indeed, the ability to ensure a life cycle assurance on quality is the key to significantly growing the voluntary market. The Integrity Council for the Voluntary Carbon Market (ICVCM), an independent governance body that will “set and enforce definitive global threshold standards”

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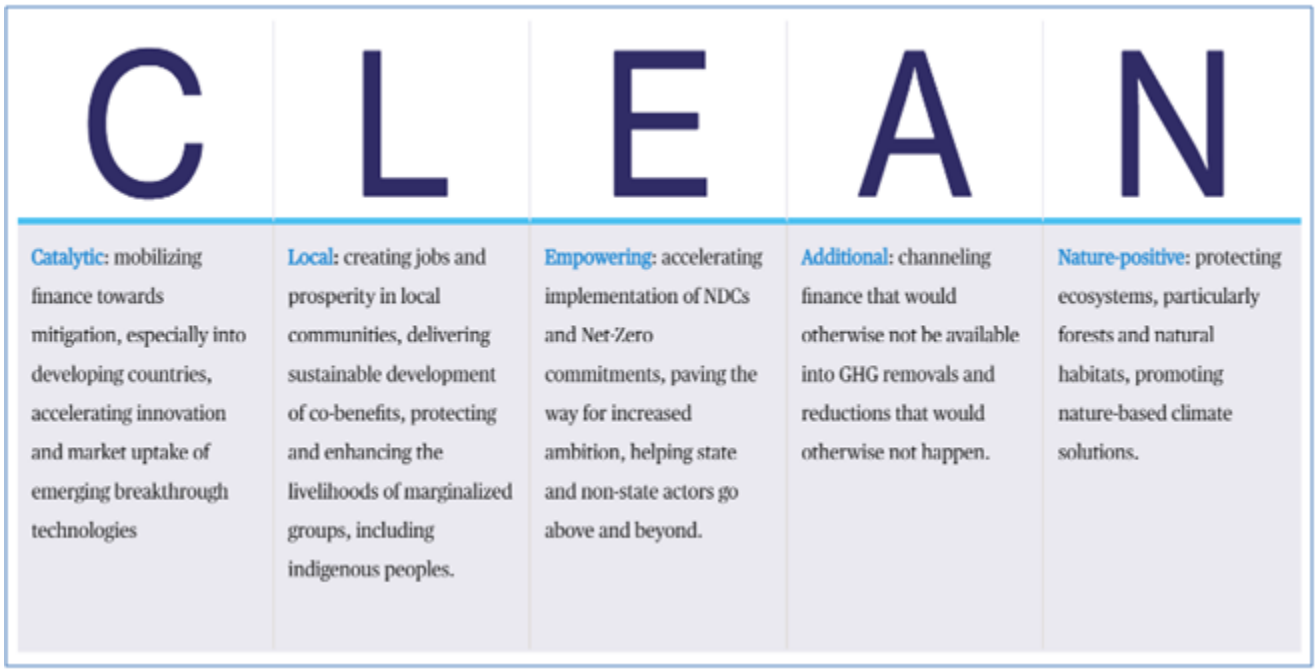
has already released its view on what a high integrity voluntary carbon market would. They have used the acronym CLEAN (see image) to define the focus. The ICVCM has appointed Annette Lazareth as its Chairperson, a professional with a background of having been an SEC regulator. Ms Lazareth refers to the current VCM as the "wild west"[7] and insists that unless each project is CLEAN and therefore 100% compliant, funds channelled into the VCM are being wrongly directed. (ICVCM.org, 2023) The ICVCM will be issuing its Core Carbon Principles (CCPs) in early 2023 (as of date of publishing, these CCPs have been released). A parallel activity currently underway is the Voluntary Carbon Market Initiative (VCMI) whose priorities include providing a robust approach to set companies' targets, defining claims, and using high-integrity credits.



Source: ICVCM[7]

It is relieving to note that Ms. Lazareth has stated that the ICVCM would be indifferent between removals and reductions and that they would eventually let the market decide on the credits they want and price it accordingly. It is critical that post issuing the CCPs, the ICVCM plays purely the role of a regulator that allows corporates and suppliers of credits to play their respective roles within the guidelines. While the CCP guidelines hinted at by the ICVCM are noble and in the right direction, it is important to keep in perspective that under the current strain from GHGs, industries like renewable energy which provide the bulk of the credits should continue to be able to participate in the voluntary carbon market.

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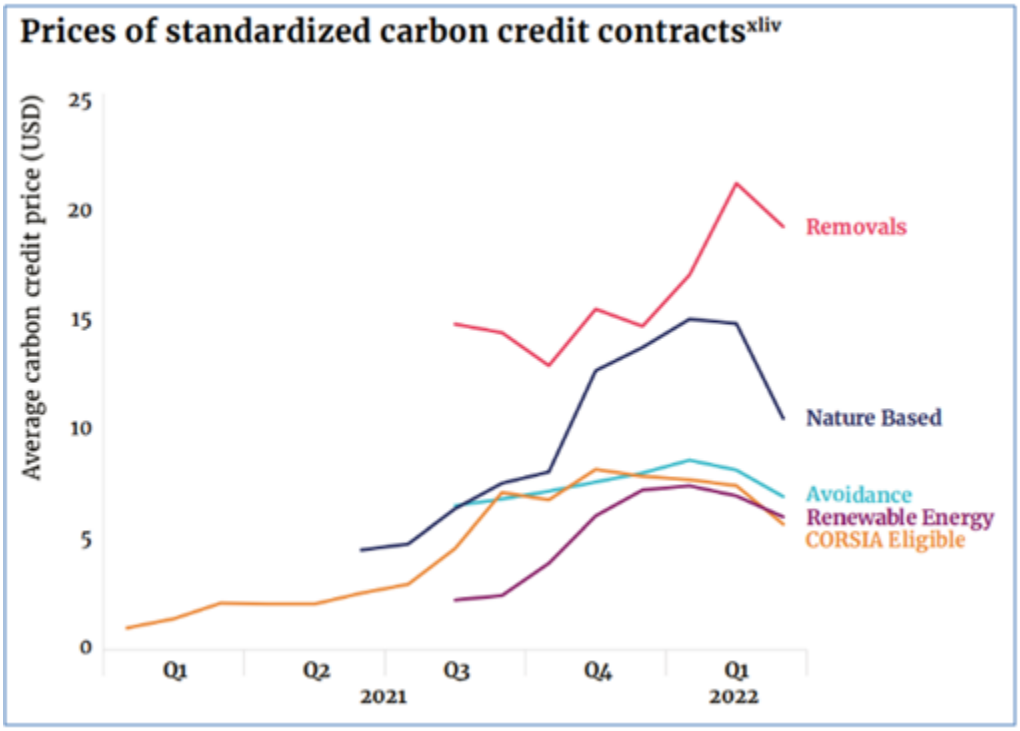
Removal versus Reduction

Corporate buyers of carbon credits have started leaning towards removal projects.52% of corporates now state that they expect removal projects to dominate their portfolio by 2030[5]. (Shell and BCG, 2023) This is as against nearly 80% of all credits issued between 2015-2021 being sourced from reduction projects. The Boston Consulting Group (BCG) expects removal credits to reach 35% of all credits issued by 2030. Most corporate voices now clearly state this bias and are increasingly seeking removal projects. In 2022 removals projects traded at a material premium to both nature based and reduction (avoidance) projects (See image).



Source: The World Bank, 2022[2]

One of the clear reasons for this bias is the higher 'quality' of removal projects. Removal projects tend to be easily measurable and quantifiable with little or no opacity. On the contrary, some reduction projects have been quite controversial. A carbon credit issuance from December 2022 highlights this concern[5]. (Shell and BCG, 2023) Forest based carbon projects earn credits by planting new trees or protecting existing forests from deforestation. The logic in the latter case is that protecting deforestation is akin to ensuring a reduction in GHGs. The sanctity of such credits depends on the quality of the effort backing them. In December 2022, credits were issued in Guyana where more than 85% of the country is covered by forests. Additionally, Guyana has lost only .36% of its tree cover between 2000-2020. The question naturally arises as to whether

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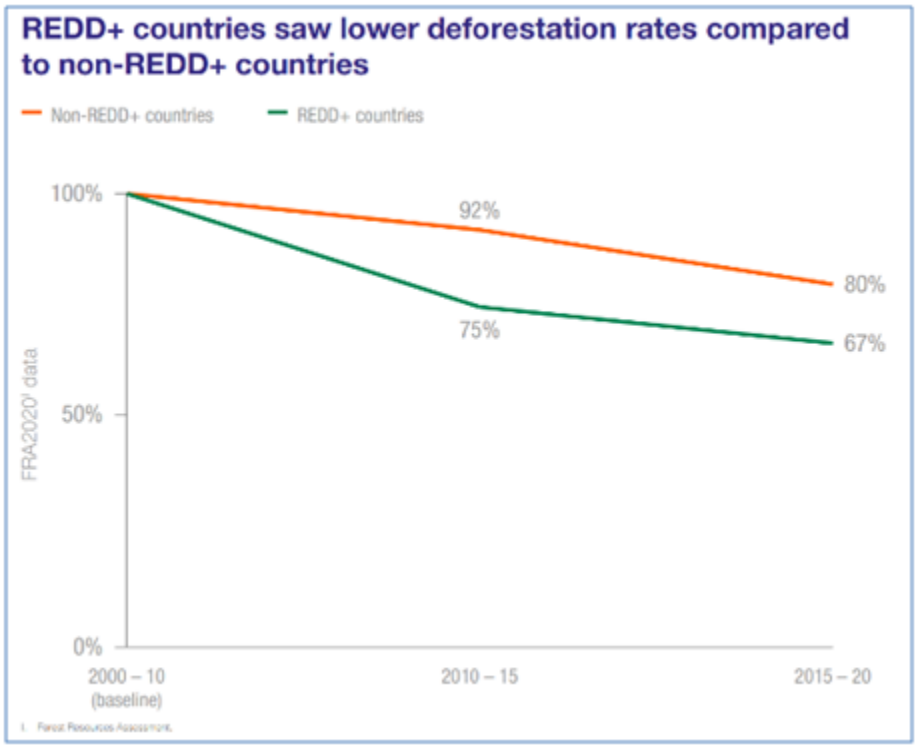
these credits genuinely reflect a reduction effort. If these credits had not been issued, would afforestation have occurred? On the other hand, if they were not issued, simple profit behaviour would lead Guyana to fell its forests just to prove that its forests are under danger and that it has earned a right to receive these credits. High Forest Low Deforestation(HFLD) countries face this moral quandary and so they receive special accreditation standards for the issuance of credits. Eventually Hess Corporation contracted to purchase these credits which could result in Guyana receiving $750 Mn by 2030[8]. (Businesswire.com, 2022) Concerned stakeholders have raised the issue that Hess Corporation (an oil and gas company) could be receiving credits that in no way reduce GHGs. The debate is not simple and has multidimensional implications.



Source: Shell and BCG, 2023[5]

Unfortunately, in today's context of a tipping point in our fight against climate change, such conversations tend to distract from the reality that what is needed is an across the board thrust on green projects. The pace of build out of nature based and renewable energy projects in developing countries is far from adequate. An effort to mitigate concerns on quality, greater third-party audit of projects and an overall initiative on project integrity is required. Interestingly, the UNFCCC REDD programme (a framework to guide activities to reduce emissions from deforestation and forest degradation) has shown clearly that this focus supported in small measure by the issuance of carbon credits have resulted in a significant afforestation reduction in

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REDD member countries. Instead of questioning whether reduction projects should continue to earn focus, what is needed is greater assurance and a significant effort to increase finance flow to all projects – both removal and reduction.

Credible Baselines and Additionality

Baselines are expressed as tonnes of carbon dioxide (CO_2) equivalent per year for the crediting period against which the GHG emissions and removals from a results period will be compared. Therefore, getting the quantification of the baseline is critical since it would define the number of credits a project would generate. In the case of renewable projects, baselining would require estimating the generation that a project would achieve. In a forest or land project, baselining would require estimating what would happen to the forest or land in an alternative scenario. Looking into the future with regard to land and forest use is a complicated mix of social, political, and economic issues and can lead to misinterpretations. Inflating baselines would result in an overestimation of the credits a project would earn.

A particularly disturbing report regarding erroneous baselines refers to the research into Verra(a leading accrediting agency) by the Guardian. The report suggests that that more than 90% of their rainforest credits are likely to be "phantom credits" and do not represent genuine carbon reductions[9].(The Guardian, 2023) The primary accusation is that Verra's rainforest credits have not shown evidence of deforestation reductions as promised. The investigating team analysed the results in 32 projects and inferred that the baseline scenarios of forest loss appeared to be overstated by about 400%.

The question of baseline is closely linked to that of additionality. Additionality refers to the need for the GHG emission reductions and removals associated with a carbon credit not to have taken place without the incentives provided by a project. Additionality has nuances of financial, technological, ecological and institutional – each referring to the same concept of the emission reduction not having been possible without the presence of the project. Baselining, therefore, requires the project to estimate the quantum of GHG emission reduction that is taking place due to the project – but it also needs to consider that such reduction would not have in any case taken place. The interpretations are complicated and difficult to arrive at a consensus on. This has polarised views on projects such as the one regarding VERRA's overestimation of impact of nature-based projects.

Leakage

Leakage refers to when voluntary projects that are issuing carbon credits inadvertently relocate the GHG emission to another location or project or, for that matter, incentivize it in another form or manner. While primary leakages where the project causes the GHG emission to move are

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relatively easy to track, secondary leakage, where they indirectly incentivize emissions, are far more difficult to track. An example of leakage could be when a renewable energy project issues carbon credits. Secondary leakage is not intuitive. Renewable energy is intermittent and therefore cannot sustain a grid by itself. Often, countries, to balance the intermittent nature of renewable energy, build out base load capacity in the form of thermal plants so that the grid can be operated in a stable manner. Would then the wind project be entitled to carbon credits? And if so, would they be issued credits net of the impact of thermal emissions? A counter argument could be that if it were not for the wind project, the entire source of energy would be thermal.

The core philosophy of carbon credits is to continue to flow voluntary money into emission reducing and removal projects. With issues like leakage cropping up, buyers have started questioning the quality of credits from VERRA, Gold Standard and other accreditors. Often the queries are impossible to address, case in point the question of how much thermal capacity is built to manage renewable intermittency.

Permanence

When we drive a car and emit greenhouse gases, the Co2 emitted is likely to stay in the environment for between 300 to 1000 years. When a carbon credit is issued, a buyer seeks to be assured that the credit has the permanence that is associated with the removal or reduction activity. An accepted industry standard is 100 years.

Reduction credits are relatively simpler to estimate. The life of a solar project is 30 years and therefore a buyer is clear that once the equipment is obsolete, the project would not mitigate any further emissions. However, with regard to removal projects, the issue of permanence is material. A carbon sequestering project that captures carbon through forests or artificially can be reversed. For example, a forest fire can completely undo any forest project and, in that sense, the carbon credits issued would be worthless in such an event. How can buyers be assured that a forest project does not get handed over to loggers at some point in the future? Or that a portion of the forest is handed over for a housing project. Technology projects like direct air capture have permanence since it is widely known that such efforts can be effective over thousands of years.

The task of assuring permanence is often akin to achieving the impossible. It can be practically impossible to judge whether a forest will be burnt down or logged away at some point in the future. Efforts are on to get this issue addressed through an insurance fund where a portion of the credits are allocated to the fund. This works much like normal insurance. Many nature-based projects would then allocate parts of the respective credits into an insurance fund and in case of a reversal in the permanence of the project, this would result in a pay out to the respective buyer.

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Unfortunately, the narrative on permanence has put some very good projects that contribute to the protection of rainforests into a negative spotlight. Once such example is the Katingan Mentaya Project, a project of 157,000 hectares(twice the size of the island of Singapore). Katingan Mentaya is a peatland forest where the soil is predominantly carbon and has therefore tremendous ability to absorb Co_2 (it absorbs 7 $mtCo_2$ annually). The license of the project is 60 years, and it depends substantially on carbon revenues to survive. Further, if it did not exist, the land would convert into a commercial forest for wood pulp. The issue of permanence needs to be able to co-opt projects like Katingan Mentaya with a 60-year license (and not 100 years). Does the narrative and expectation of permanence, thereby limiting revenues to this nature reserve, help the cause of $1.5^{O}C$?

Influence by Industry Groups

Voluntary carbon markets are conservatively expected to grow by 5X by 2030[5]. The current $2 Bn value of the market is likely to grow to between $10 Bn to $40 Bn and address between 0.5 - 1.5 $GtCO_2$[5]. (Shell and BCG, 2023) That would make it the size of the aviation industry, a major global emitter. The early origins of the voluntary market through the CDM mechanism have now been dwarfed by the fast adoption of the Race to Zero by various entities. With both dollar value and emission counts having reached sizeable scale, the voluntary market has started receiving significant attention.

One persistent continuing problem is that of greenwashing. Are Net Zero firms purely interested in cosmetically addressing their stakeholders through purchasing carbon credits? Can a firm address its net zero aspirations purely by buying carbon credits? The question of what Net Zero means for entities is a question that is facing most aspirants. Two significant industry groups have emerged trying to address this query. The SBTi (Science Based Targets initiative) and the VCMi (Voluntary Carbon Markets initiative)are now beginning to prescribe what net zero means. The SBTi has come up with Net Zero standards in 2021 which states that carbon offsetting through credits needs to be limited to 5-10% of a company's emissions. Unfortunately, a one size fits all prescription may doing more harm than good. As companies seek to in source their efforts, the very nature of such efforts is likely to be long run in nature. While the SBTi does prescribe a 5–10-year horizon for short term targets, this blanket embargo on limiting carbon credits to 5-10% seriously affects the flow of funds to projects with clear additionality and the need for such revenues. Projects based on technology-based removal are clearly not viable without the support of significant carbon revenues. Of course, while the SBTi standard is purely voluntary, an increasing number of net zero aspirants are seeking the validation of such forums for lending legitimacy to their efforts.BCG evaluated the influence from such bodies on 200 net zero aspirants. The responses suggest that these industry bodies are also providing guidance on the credit types that need to be bought. This trend is a cause for concern. Standards

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setting groups need to be independent and neutral bodies that take a considered view of all aspects of an economic environment. Depriving needy projects in the global south of carbon revenues through idealistic standard setting could deliver significant harm to GHG mitigation.

Government Intervention and Article 6

The Paris agreement imposed Nationally Determined Contributions (NDCs) in terms of greenhouse reductions from each of its member countries. Article 6 of the agreement detailed out the ability of countries to trade their NDCs with each other and therefore allowed a country with a low cost of abatement to trade in their NDCs with countries which had costs of abatement. This required each country to put in place a national framework for article 6 authorisation.

As countries enact legislation to put in place an article 6 framework, such legislation is increasing coming into conflict with the voluntary market. If carbon credits are to qualify within article 6, they would require the selling country to reduce such emissions from their register and pass on the benefits to the buying country. Not all countries are keen to do so and there are signs that countries will require carbon credits to be part of the article 6 framework rather than part of an independent voluntary market.

Indonesia is a case in point. As one of the largest global suppliers of forestry project carbon credits, Indonesia has restricted the sale of credits produced by their rain forests into the voluntary carbon market[10]. (The Wall Street Journal, 2022) The move has unsettled global carbon markets that depended on these credits to mitigate their emissions. All exports or sale of carbon credits in Indonesia are now subject to the approval of the ministry of environment and forests, which will likely give such approval if they do not need it for their NDCs. This, even though these projects may actually be on private land. India has so far not restricted the sale of credits globally.

Carbon credits will clearly fare better and create greater liquidity for mitigation under the voluntary market. The CDM mechanism under the Kyoto protocol continues to be an example on why governments are not the best sellers of credits. The EU withdrew its acceptance of credits under CDM for trading on the EU ETS. This resulted in developing countries permanently losing the ability to raise funds for mitigation projects from CDM. As countries pass legislation, they should remember that the best source of funds would always be a vibrant voluntary market rather than a sticky and rule bound credit under article 6.

Keeping our eyes on the eventual goal

The voluntary carbon market has surged to $2 Bn and participants aspiring to net zero now view their demand for carbon credits as non-discretionary[5]. Additionally, demand for carbon credits is

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expected to grow to 1.5 $GtCO_2$by 2030. 1,045 companies representing USD 23 trillion in market capitalization have committed in the past year to set targets that align with a 1.5°C pathway. The industry has seen a rich variety of projects seeking accreditation – as many as 170 kinds of credits have been established. As the industry matures, stakeholders are seeking greater regulation on the quality of credits and setting standards on net zero claims. The industry is now seeing new industry bodies that are seeking to influence the way buyers behave. Additionally, the ICVCM has entered the market as a regulator and will be issuing new "core carbon principles" later this year. An added uncertainty are the reactions from various global south countries that are seeking to restrict the voluntary market in favour of aligning them with their NDCs.

In this backdrop it is important that the ecosystem does not miss the woods for the trees. Since 2005, the voluntary market has channelled more than $8 Bn into the global south for funding various green projects. These projects need these funds to be viable and facilitate further flows into new projects.

Regulators, influence bodies, governments are all trying to pull the industry towards what they view is the right direction for it to grow in. While these efforts are important and needed to clear the environment for a significant ramping up of the voluntary market, they should not result in choking the ability of projects to access cross-bordernet zero funds. After all, we are not far away from a possible point of no return in our battle for a cooler earth.

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