



Financing the Transitions the World Needs: Towards a New Paradigm for Carbon Markets

About the Author

David Antonioli is a strategic advisor who specializes in harnessing the power of markets to solve critical environmental issues and support sustainable development.

David has worked on climate change for the last 30 years and most recently served as CEO of Verra from 2008 until June 2023. David's experience includes working in the private sector as a project developer (EcoSecurities) and as a government official (USAID in Mexico).

His company, Transition Finance, supports clients in the design of financial instruments to support the green transition.

The company's website can be found at www.tranfin.com

Acknowledgements

I am deeply grateful to the following people and organization for tremendously helpful comments on earlier versions of this report: Amy Bann, Ben Devine, Charlotte Streck, Donna Lee, Jen Stebbing, John Paul (JP) Moscarella, Pedro Moura Costa, Renat Heuberger, Ricardo Bayon, Siddarth Srikanth and the Association for Integrated Research and Development (AIDER, by its Spanish initials).

I am also indebted to Emily Sadler whose design skills were invaluable and improved the report considerably.

Published: 16 July 2024

© Copyright David Antonioli / Transition Finance

Contents

Introduction	5
Chapter 1: Designing for the Green Transition	13
Chapter 2: Rethinking Additionality	31
Chapter 3: Embracing Government Participation	45
Chapter 4: Integrating Natural Climate Solutions	59
Chapter 5: Carbon Credits for the Energy Transition	73
Chapter 6: Net Zero Not Enough	83
Conclusion: Towards a New Paradigm for Carbon Markets	91
Appendices	99



Introduction



Overview

After spending 30 years working on climate change and the last 25 on carbon markets, I am a strong believer in the critical role they have played and continue to play in helping to solve the climate crisis. I believe that carbon markets are a force for good and am inspired every day by the thousands of incredible projects that have channeled millions of dollars to fight climate change, many of which also have benefitted individuals, communities and biodiversity. I am hugely encouraged by the recent developments and initiatives designed to strengthen carbon markets and believe we can build a new chapter that leads to even greater scale and climate impact.

Achieving this, however, will require a paradigm shift that moves us beyond treating a tonne of carbon as the ultimate end to embracing carbon finance as a means to a broader and more enduring objective. Carbon markets today mostly start and end with a tonne of carbon, without necessarily being designed as a transitional tool that leads to long-term sustainable outcomes. This should not be surprising. Carbon markets were born from the idea of putting a price on carbon and have been designed to ensure that a company can stand behind a tonne of carbon. As a result, they have deployed millions of dollars of investment and have demonstrated a new source of finance that is nimble, moves fast, and can fill key funding gaps (e.g., where banks aren't ready to lend capital to).

Nevertheless, carbon markets remain a niche opportunity that could benefit from a rethink of its ultimate objective, and therefore some of the tools and approaches it continues to use. Despite all of the efforts market stakeholders have collectively put into the design of carbon markets, not much time has been spent designing the system so that the limited but scalable finance provided through the sale of carbon credits leads to the kinds of transitions the world desperately needs. In an ideal world, carbon finance would be designed to introduce new technologies and practices, reduce costs and build the necessary capacity that catalyzes further and sustained climate action on its own, without the need for further carbon finance. While many market actors might be working under that assumption, the market as a whole has not made such an objective explicit. Unless we design this market to achieve that broader objective, we risk getting to the end of projects' crediting periods and facing a situation where the underlying activities stop or do not scale.

Being able to move to the new paradigm will require transcending the market's current focus, which is currently almost exclusively on the details behind carbon crediting. These details are critically important because the accounting is at the core of what is being transacted. Importantly, these details are being addressed head on. For example, the [Integrity Council for the Voluntary Carbon Market \(ICVCM\)](#) is laser focused on ensuring the integrity of supply, while the [Voluntary Carbon Market Integrity Initiative \(VCMI\)](#) is ensuring the integrity of claims made in respect of the purchase and retirement of carbon credits (i.e., the demand side of the equation). In addition, numerous guidelines have been put forth to guide the market as it evolves, with the most recent one having been published in May 2024 by the [U.S. federal government](#). These are great initiatives and we need to make sure they enable us to move beyond the current debate so that we can reinvigorate the discussion around carbon markets and consider the opportunity we have to redesign this source of financing to fight climate change at scale.

A critical element of the new transitional paradigm will require a deep understanding of the drivers that can ensure the technologies and practices being introduced through the sale of carbon credits endure over time. This means that, on the one hand, carbon markets need to embrace opportunities where carbon finance can provide the early-stage financing that then enables long-term profitability. While the market needs to guard against providing financial support for activities that do not need an extra push early on, the truth is that many new technologies and practices face tremendous obstacles in the early stages. For starters, they often face entrenched business interests who will fight hard to avoid losing their market share. New entrants also have to demonstrate that their technologies or practices work as well or even better than the incumbent ones. Structured properly, carbon finance can ensure that it supports the businesses of the future that can make a dent in the huge climate challenge we face.

On the other hand, there are some project activities that will never be able to develop long-term sustainable business models (e.g., projects that reduce industrial GHGs). In these cases, we should not be content with letting them run through their crediting periods given that the end of those will likely mean a return to what was occurring prior to project implementation. It would also represent a missed opportunity for further climate action given that much of the investment has already been made. We therefore need to embrace government participation, including regulation in the future in exchange for the early financing that carbon markets can provide today.



The most critical reason to move to this new transitional paradigm is that the nature of the challenge has changed drastically. Carbon markets, and most of the rules governing carbon credits, were first designed when there was an understanding that climate change would eventually be brought under control through top-down regulation, including the development of cap-and-trade programs around the world. In this context, carbon credits were a tool that could help companies meet increasingly ambitious targets. The Clean Development Mechanism (CDM) set out under the Kyoto Protocol enshrined that approach.

That world, however, never came to pass; governments have been unable to muster the political wherewithal to regulate greenhouse gas (GHG) emissions. Instead, the world created the bottom-up framework set out under the Paris Agreement, which ideally adds up to keeping temperatures below 1.5°C. Nevertheless, important emissions targets continue to be missed, including year-on-year increases in GHG emissions, as opposed to the reductions needed to reach global targets. In addition, full implementation of all Nationally-determined Contributions (NDCs) would only limit warming to 2.5°C, a full degree warmer than our globally agreed target.¹

¹ United Nations Environment Programme (2023). *Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again)*. Nairobi. <https://doi.org/10.59117/20.500.11822/43922>



As a result of the challenge, we need to make sure that every single tool in the toolbox is designed to maximize its impact. That means carbon markets have to transcend their current role as a tool that enables companies to compensate for unabated emissions to a mechanism that also channels this unique and limited source of finance in a way that supports the green transition. In other words, we need to leverage all that we have learned about carbon markets to date, including the vast knowledge that has been developed in respect of the accounting of carbon credits, to shift the market from being focused exclusively on the offset side of the equation to supporting the types of transitions the world needs. Adding that view can help the market reframe its overall objective while informing some important changes that are needed to ensure it has maximum impact.

I prepared this report to set out the main insights I have been able to distill after more than two decades of participating in the market. I wrote this report with the hope that the insights I am sharing can help inform and improve carbon markets as they evolve, and in the process support the restoration of trust and confidence that I believe is already underway. In particular, I am hoping that by adding another dimension to the debate (i.e., the need to ensure carbon finance is used as a transitional tool), we can have a more thoughtful discussion about what it is we are trying to achieve and the rules and requirements that govern the market. I sincerely hope that this report will complement the work others are doing to move the markets forward. In the end of the day, carbon markets can only achieve climate impact at scale if they both address issues around integrity and establish a broader, more enduring and compelling objective.

This report consists of six chapters, with each one of them covering a distinct topic related to the overall concept of using carbon finance as a transitional tool.

- Chapter 1 introduces the general concept -- the need to think about the broader transition by considering the point at which carbon finance should stop, developing a process that is less cumbersome to navigate and outlining some of the tools we already have that can help lead the way forward.

- Chapter 2 proposes an alternative way of thinking about and testing for additionality that has, at its core, enabling the transition of sectors of the global economy.
- Chapter 3 explores both the opportunity and the need to engage governments in a thoughtful and productive manner that enables them to leverage carbon finance to facilitate the green transition.
- Chapter 4 discusses the need to integrate the various aspects of natural climate solutions (NCS) so that carbon can provide an effective tool to both manage broader landscapes and enhance the durability of NCS interventions, thereby leading to a broader transformation of the Agriculture, Forestry and Other Land Use (AFOLU) sector.
- Chapter 5 revisits the crediting of grid-connected renewable energy projects with the new lens of needing to consider the broader transition.
- Chapter 6 sets out some reflections on the sheer scale of the challenge at hand, and why it is critical that we move towards a new paradigm for carbon markets that considers carbon finance as a transitional tool to support the green transition and help meet the targets set out under the Paris Agreement.

I conclude the report by revisiting the fundamental question about what is needed to address climate change and the role carbon markets can play. I also try to put this report in the context of the inflection point the market finds itself, noting that the changes I am proposing require deep discussions and some further work to make them a reality.





Chapter 1

Designing for the Green Transition

Introduction

Although carbon market stakeholders have spent a considerable amount of time and effort working out the various rules and requirements that govern the creation, sale and retirement of carbon credits, scant attention has been paid to the long-term impact that these markets have. In an ideal world, carbon finance would provide the upfront financing needed to catalyze the transformation of entire sectors of the economy. For example, carbon finance can provide the early capital needed to introduce new practices, build capacity and, in the case of new products, begin establishing local production, distribution and repair networks. All of these can de-risk larger-scale investments that then lead to large-scale adoption.

Nevertheless, carbon markets have not been designed to serve that transitional role, at least not explicitly. The original purpose of carbon markets was to put a price on carbon and help companies meet stringent emission targets. By providing alternative options for meeting these targets, carbon credits avoided painful economic displacement that could then create a backlash and threaten further climate action. As a result, the rules and requirements around carbon markets were designed to achieve the lowest-cost abatement opportunity, which means there has been an almost exclusive focus on making sure that the emission reductions and removals achieved equaled the damage the polluting company was unable to reduce itself.

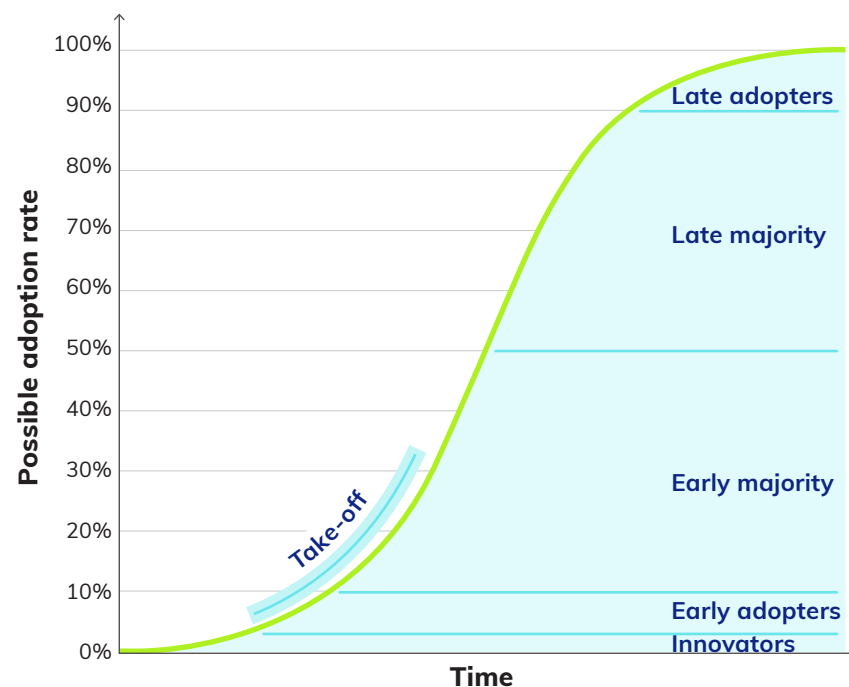


The existing paradigm has resulted in thousands of projects and significant investment, and it has generated tremendously positive impacts on people, communities and ecosystems. In some cases, private project developers, NGOs and multilateral banks have leveraged carbon markets to achieve a broader mission. To a certain extent, jurisdictional crediting programs are largely geared toward such goals. However, the vast majority of the market's activity has been undertaken with a view to achieving emission reductions or removals that one can stand behind, with secondary consideration for how the investment being deployed through carbon markets can be used to catalyze the long-term transitions we really need. Such an outcome may be broadly desired by the vast majority of market participants, but it has never been made explicitly clear. As a result, the existing rules and requirements do not necessarily lead to those types of transformational outcomes.

The Challenge is Adoption at Scale

This framework means we are only focusing on half of the equation – the creation of carbon credits – and that we are missing a golden opportunity to design and deploy carbon finance as a proper transitional tool to assist in our challenging journey towards sustainability. A simple way to think about this is to consider the adoption curve (Figure 1), which posits that new technologies and/or practices get adopted over time by different segments of the population until they become common practice.²

FIGURE 1. S-CURVE ADOPTION CURVE



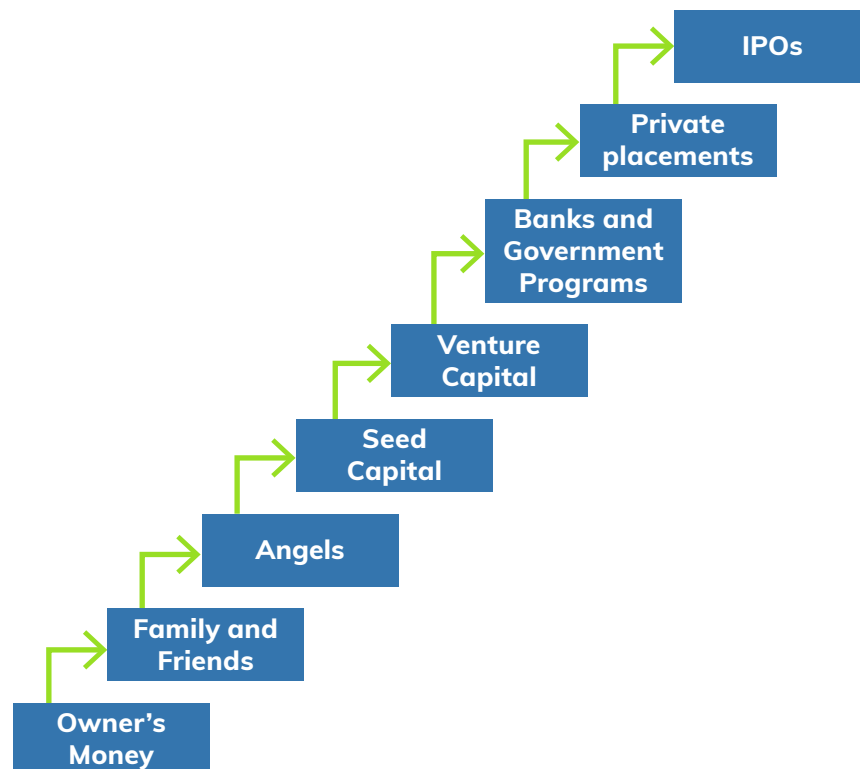
Source: www.pinnaxis.com

² This diagram introduces five different segments of the population (i.e., Innovators, Early Adopters, Early Majority, Late Majority and Late Adopters, or Laggards) and the challenges each one of them faces as they adopt new technologies or practices. The next chapter will dive into this further and use this framework as a jumping off point for rethinking how to assess additionality.

In this context, carbon finance can be framed differently, with a broader objective. Specifically, what if we thought of carbon as a means to an end, rather than the end in itself? For example, what if we use carbon finance to introduce new technologies and/or practices up until the point that new interventions no longer depend on this additional source of finance. The team at Exeter University has elegantly called these **Positive Tipping Points (PTPs)**, and they are built on the idea that a small change (e.g., strategic upfront financing to introduce new technologies and practices) can lead to widespread, self-sustaining shifts to low- or no-carbon technologies or practices.

Achieving that long-term adoption will require a whole host of enabling conditions. One of the most critical ones is the provision of commercial-grade investment opportunities, beyond the mostly concessionary options available at the point new technologies and practices are first introduced to new markets. Figure 2 below illustrates a generalized financing continuum, setting out how businesses that grow can seek new, larger and different pools of capital. Carbon finance tends to be located on the lower-left hand side of the diagram. If carbon finance is to serve a truly transitional role, it needs to be a stepping stone to greater investment. In other words, carbon finance needs to be designed such that it is helping to solve some of the challenges with moving up the finance continuum, such as de-risking future investments in the sector.

FIGURE 2. THE FINANCING CONTINUUM



Source: www.chegg.com



Image credit: Dennis Jarvis
via Flickr, CC BY-SA 2.0

Three examples from the carbon markets serve to illustrate how carbon finance can play a key transitional role in respect of a particular sector's transformation.

- **Regenerative agriculture.** Changing agricultural practices is not easy for most farmers given the risks involved and the fact that there is a natural resistance to changing practices that have worked in the past, especially where daily sustenance is at play. Carbon finance can therefore cover the initial costs and risks associated with regenerative agricultural practices, and demonstrate that these practices, over time, can be beneficial to farmers by diversifying their incomes, generating higher yields (in many cases) and improving their ability to deal with droughts and floods. The adoption curve suggests that once enough farmers have adopted these practices, they become common and new farmers adopting them no longer need an extra incentive (e.g., carbon finance) to make the switch.

This does not happen by itself, however; ensuring these outcomes also requires adaptation by the institutions that support farmers. Banks, for example, can play a key role in lending to farmers making the transition, but will only do so if early experiences (e.g., those financed through carbon finance) have de-risked the entire proposition. Entrepreneurs may also start providing services and support to farmers making the transition (e.g., training, troubleshooting, specialized equipment), but only once it becomes profitable, which implies achieving a minimal level of adoption. The measurement, reporting and verification (MRV) industry also may be keen to invest, but only once there is sufficient demand for monitoring soil carbon samples that then encourages entrepreneurs to invest in laboratories that can test these.



Image credit: Russell Watkins/Department for International Development via Flickr, CC BY 2.0

- **Clean cookstoves.** This theory of change could also play out in respect of clean cookstoves given that the benefits of these devices are very well documented (e.g., cleaner indoor air, less time spent and reduced insecurity for women searching for wood in outlying areas), suggesting that, over time, families may be willing to pay for purchasing and maintaining clean cookstoves. That may not be the case in the early days of distribution, especially because costs at this stage are likely to be prohibitive for families. However, investments in local manufacturing and distribution channels, as well as qualified technicians to repair damaged equipment, could end up lowering the cost so that purchasing a clean cookstove becomes more accessible, at which point carbon finance will no longer be necessary. None of this is likely to happen as long as cookstoves are imported from afar and given out for free.

- **Low-carbon concrete.** New technologies such as those that embed CO₂ into cement provide excellent examples of how carbon finance can help mainstream these kinds of innovations. By introducing new technologies carbon finance can help bring down manufacturing costs, provide the testing grounds to demonstrate that the new concrete produced with this innovative solution is just as strong as traditional concrete, and de-risk new investments, thereby further strengthening adoption across the entire industry.

In all of these examples carbon finance can move beyond simply generating emission reductions and removals to serving the critical role of de-risking the scaling of these new practices and technologies. This does require that we start with the end in mind, meaning that we need to consider what the world should look like once carbon crediting has run its course and is no longer available. Doing so will require careful research and consideration, and yet is well within reach if we draw lessons from other sectors of the economy where these transitions have occurred.

However, the rules and requirements that currently govern carbon markets, especially those related to assessing additionality, are not well-suited to enabling the types of sectoral transitions the world needs. Carbon finance is, for all intents and purposes, a subsidy, and a thorough approach would suggest needing to consider and plan for what happens when that additional source of finance runs out. Carbon finance should not be expected to run forever, nor should we be hoping that some other similar source of finance will come in and save the day. In addition, our current approaches for determining additionality have created a process that is simply too cumbersome to navigate, which ends up undermining investment and limiting the kinds of sectoral transitions we desperately need. The good news is that we already have a working model that we can use as the basis for updating how we test for additionality.

Markets Tend to be Efficient

One critical aspect of carbon markets, and any market for that matter, is that they enable investments in new technologies and practices in a transparent and efficient manner. This is particularly relevant given the demands of having to reduce emissions within one's own supply chain. While this approach is laudable, it can be incredibly challenging in cases where the sources of emissions are diffuse and/or poorly reported, such as in the case of agricultural inputs into the supply chains of food companies. Likewise, it can be difficult to procure a sustainable product because it simply may not exist in the market where demand exists. Low-carbon concrete is a great example where transportation costs make it prohibitive to ship across long distances. In both of these examples, investments in these new practices and technologies will both reduce emissions and, if the interventions are designed correctly, lead to the full transformation of the sector, which will go a long way in addressing the need to track and mitigate emissions down to the source.



What is the End Game?

One of the key limitations of the carbon markets' current rules and requirements is that they do not effectively set out the point at which carbon finance is no longer necessary to enable the evolution of the sector. As a result, the current rules and requirements do not set the market up for considering whether the activity or practice that has been introduced through carbon finance will survive on its own. This long-term equilibrium could be achieved, for example, because the activity has been demonstrated to be economically viable on its own, and/or governments have put regulations in place, both of which become more likely if we ensure that carbon finance brings down costs, builds the necessary capacity and de-risks future investment. If we do not consider this in the design, we risk coming to the end of projects' crediting periods with no plan to ensure the continuation of the project activities. In the examples above, we might get some farmers to switch to regenerative agricultural practices, some households to adopt clean cookstoves, and the production of limited volumes of low-carbon concrete, all of which would certainly generate emission reductions and removals. However, unless we design the system to maximize the likelihood that the entire sector switches to the less polluting alternative, we may end up with a marginal impact, or worse yet, backsliding to the situation that prevailed before these projects ever got implemented.



Image credit: Z22 via commons.wikimedia.org, CC BY-SA 4.0

I have seen what happens when there is no long-term plan. A number of the landfill gas (LFG) capture and destruction projects I developed under the Clean Development Mechanism (CDM) while at EcoSecurities have been mothballed because once the carbon revenues dried up (after the 10-year crediting period ended) there was no one else to cover the costs. As a result, some of the equipment (flares) has been vandalized, there are pipes in the ground that are not being used, the technicians we trained are working elsewhere and methane emissions are being emitted to the atmosphere. The same thing could be said for many of the projects

that relied on carbon finance to destroy industrial emissions. Once the sale of carbon credits stopped, many of these struggled because there was no way to finance ongoing operations. There was some understanding and perhaps misplaced hope at the beginning of these projects that government regulations would materialize, but they never did. In the end, these projects did reduce emissions (highly additional by our current definitions, by the way) and enabled some European companies to meet their Emissions Trading System (ETS). However, we did not plan for a longer-term transition, and therefore missed an opportunity to foster further climate action.

At the same time, the LFG projects we developed that generate electricity are still operational, which highlights an important tension in the carbon markets – projects that have an underlying economic rationale (i.e., they can make money) tend to be viewed with suspicion as to whether they are deserving of carbon finance. Such skepticism is good as it will ensure integrity, but the market needs to embrace those projects that can be economically self-sustaining in the future, precisely because they are the kinds of businesses that can readily lead to the type of longer-term transitions the world needs. Indeed, these types of projects are uniquely positioned to answer the question about when to stop approving new projects, provided we can define the PTP.



As it stands, most of the tools used to assess additionality do not address this question, or do so in a way that does not lead to a clean resolution.

- **Additionality tool.** When using both the CDM and the AFOLU additionality tools, the question about when to stop approving new projects is never raised explicitly. Rather, it is handled implicitly by assuming that crediting will stop once projects are considered non-additional. This makes for an inherently fraught process because what counts as additional varies by project and means there is no clear cut off point, which also undermines long-term investment in the sector.
- **Standardized methods.** These approaches, which are the newest innovations for assessing additionality in the carbon market and include both positive list approaches and performance benchmarks, do not effectively address the question about when new projects should stop being approved. While many of the positive list approaches currently in the market rely on activity (i.e., market) penetration for the activities being approved, these tend to be insufficient for a number of reasons, including the fact that they:
 - Do not reflect any differentiation across sectors or project types; and
 - Are not properly benchmarked against any academic or theoretical research that would underpin a theory of change based on a broadly agreed upon objective, including the level of market penetration needed to ensure new practices or technologies become common practice.

It is worth noting that the CDM has a tool for assessing common practice that relies on a market penetration of 20 percent. However, this assessment is not meant to replace the use of the additionality tool and is therefore not used as a threshold for determining additionality.

Another key limitation of the dominant approach to assessing additionality is that it is inherently short-term. By focusing exclusively on the immediate project being considered, the dominant approach seeks to determine whether the project would be built today, without considering what is needed for the full transition in the future. While this may work for identifying project opportunities where a company can use the emission reductions or removals against a target, it deprives the market of a longer-term perspective. In particular, the current approach does not provide the long-term confidence investors need to make large bets, such as those that are required to build local manufacturing, distribution and repair capacity. This short-term thinking makes it very difficult to contemplate what the end game should look like.

Standardized Approaches – The Basics

Carbon markets have made several attempts to standardize key elements of the crediting process to avoid the project-by-project assessment required when using the additionality tool. While there are a number of different approaches, generally speaking these break down into two broad categories.

- Positive lists.** These approaches pre-determine those activities that are by definition additional based on a variety of factors, which can include low market penetration, no financial returns beyond the sale of carbon credits, or a financial assessment done at a macro scale. For instance, the regeneration of degraded lands in a particular region could be considered a positive list approach given that such lands are often not restored on their own. Positive list approaches do not address the crediting baseline, which still needs to be done on a project-by-project basis. In the case of the regeneration of degraded lands, one would have to estimate how much carbon would be stored in the absence of active restoration efforts and subtract that from what is achieved by implementing the project.
- Performance benchmarks.** These approaches pre-determine both additionality and the baseline across an entire sector, normally by establishing a requisite threshold of performance per unit of input or output. These thresholds establish both the point at which an intervention is considered to go above and beyond what otherwise would have happened (i.e., is additional) and the volume of credits a project developer can generate. While performance benchmarks are more commonly considered for industrial sectors where the thresholds can be set on the basis of units produced (e.g., tCO₂ per tonne of cement produced), there are some excellent examples in the AFOLU sector (e.g., [VM0035](#) under the VCS Program, which establishes a performance benchmark for improved forest management projects implementing reduced impact logging).

The table below summarizes the key differences between how projects are assessed against both additionality and the crediting baseline using the main tools available in the market today -- additionality tool, positive lists and performance benchmarks.

Overarching Approach	Additionality		Baseline and crediting	
	Project-by-Project	Standardized (across sector)	Project-by-Project	Standardized (across sector)
Additionality tool	✓	✗	✓	✗
Positive lists	✗	✓	✓	✗
Performance benchmarks	✗	✓	✗	✓

Process vs. Assessment: There is a Difference

Much of the debate today around additionality, as well as other issues related to the integrity of carbon credits, revolves around the critiques that some individuals have leveled at specific projects. While these critiques can serve to improve key aspects of the market, it is important to recognize that they are fundamentally different than the outcomes reported by certified projects. Specifically, these critiques tend to be based on specific criteria selected by those making these assessments, which is in stark contrast to the outcomes from projects which are following specific procedures set out by GHG crediting programs. By and large these procedures are developed following robust regulatory-like procedures that include getting input from experts, conducting public consultations and developing the final rules and requirements that projects must follow. These procedures are not perfect, but they reflect a fundamentally different process than what is followed by individualized assessments. In a way, this represents an apples and oranges comparison, and we need to be thoughtful about using these individualized assessments to improve the process, not throw it out completely.

Cumbersome, Costly and Time-consuming

The other important consequence of relying on the dominant approach for determining additionality, as set out in the additionality tool, is that it tends to require an incredible amount of paperwork and review, and as a result creates long backlogs for project approval. Generally speaking, the process requires the preparation of lengthy project descriptions that include numerous justifications that then have to be vetted by both auditors and the relevant GHG crediting program.

This challenge is not new to the carbon markets. Indeed, one of the driving objectives behind the creation of the VCS Program in 2005 was to create a counterpoint to the CDM, which at the time was causing lots of concerns amongst market stakeholders, especially in respect of the length of time the CDM and its Executive Board were taking to make decisions about projects.

The initial rationale for creating the VCS was therefore sound -- the CDM was overly bureaucratic and slow. However, the requirements underlying the VCS were not fundamentally different than those that underpinned the CDM, and the main changes/simplifications that were made initially (e.g., putting more trust in VVBs, the multi-registry system, and allowing projects to submit registration and issuance requests at the same time) did not sufficiently revise the underlying rules and procedures that created the backlogs in the first place.



Image credit: ©2009CIAT/
Neil Palmer via Flickr
CC BY-SA 2.0

One of the enduring impacts of the additionality tool is that it has created a tacit requirement for conducting in-depth, project-level reviews that seek to ascertain the dynamics in a particular sector of the economy. This makes sense given that proper use of the additionality tool requires a deep understanding of the sector in which the project occurs, which means that a proper review of any project should reflect thorough knowledge of the challenges a particular technology or practice faces in the context of its sector. However, this approach creates an incredibly arduous process that has direct consequences on the approval process.

- **Long backlogs.** It is no mystery that the system is currently hampered by massive backlogs, with projects languishing for long periods in either the initial auditing or final review process managed by GHG crediting programs. These time lapses are a result of the way the process has been designed, which requires the preparation of a project document, review by both auditors and the GHG crediting programs, and multiple rounds of reviews that involve the developer and the auditor, the auditor and the crediting program, or all three parties. We have created a universe that requires project developers to prepare what is essentially a PhD thesis (project descriptions commonly run past 100 pages) that then has to be defended twice, before an auditor and then before the relevant GHG crediting program.
- **Need for deep sector expertise.** As mentioned above, the dominant approach to additionality requires a deep understanding of the sector in which the project is operating. This ends up putting a tremendous amount of pressure on both auditors and the relevant GHG crediting programs to have the necessary expertise on hand. Anecdotal evidence suggests that much of the back and forth between project developers and either the auditors and/or the relevant GHG crediting program is dedicated to explaining the ins and outs of particular industries.

- **Disenfranchise key stakeholders.** The existing review process disenfranchises individuals, communities and companies from the global south by making it very difficult for them to access carbon finance. The drafting of project descriptions is not for the faint of heart and requires specialized knowledge and significant resources. Indeed, the current review process further creates a cycle of dependency on high-priced consultants, generally from the global north.
- **Ongoing questions about benefit sharing.** One of the key consequences of disenfranchising stakeholders from the global south from participating in the carbon markets directly is that it is practically impossible to determine whether a particular benefit sharing model is fair or not because these are most often intermediated by developers and consultants from the global north.

For a long time the approach to solving the challenge related to the complicated review process has been to throw more people at the problem – hiring more staff to deal with the oncoming rush of projects and building the necessary expertise, both within the auditing community and at the GHG crediting programs. This has proven elusive, and while still may be possible, the market would still be left with a fairly clunky approach that is hard to scale and therefore hampers climate action.

Hard to Capture Everything in a Number

Even though it is broadly recognized that additionality can be assessed in many ways (e.g., by looking at a variety of barriers), there is a tendency amongst many stakeholders to view financial additionality (i.e., comparing the internal rate of return of the project in question with and without carbon revenues) as the correct way of looking at this complicated topic. However, a strict financial additionality perspective is likely to miss some of the structural, financial, political and regulatory challenges innovative technologies and practices face when trying to gain traction in a new market.

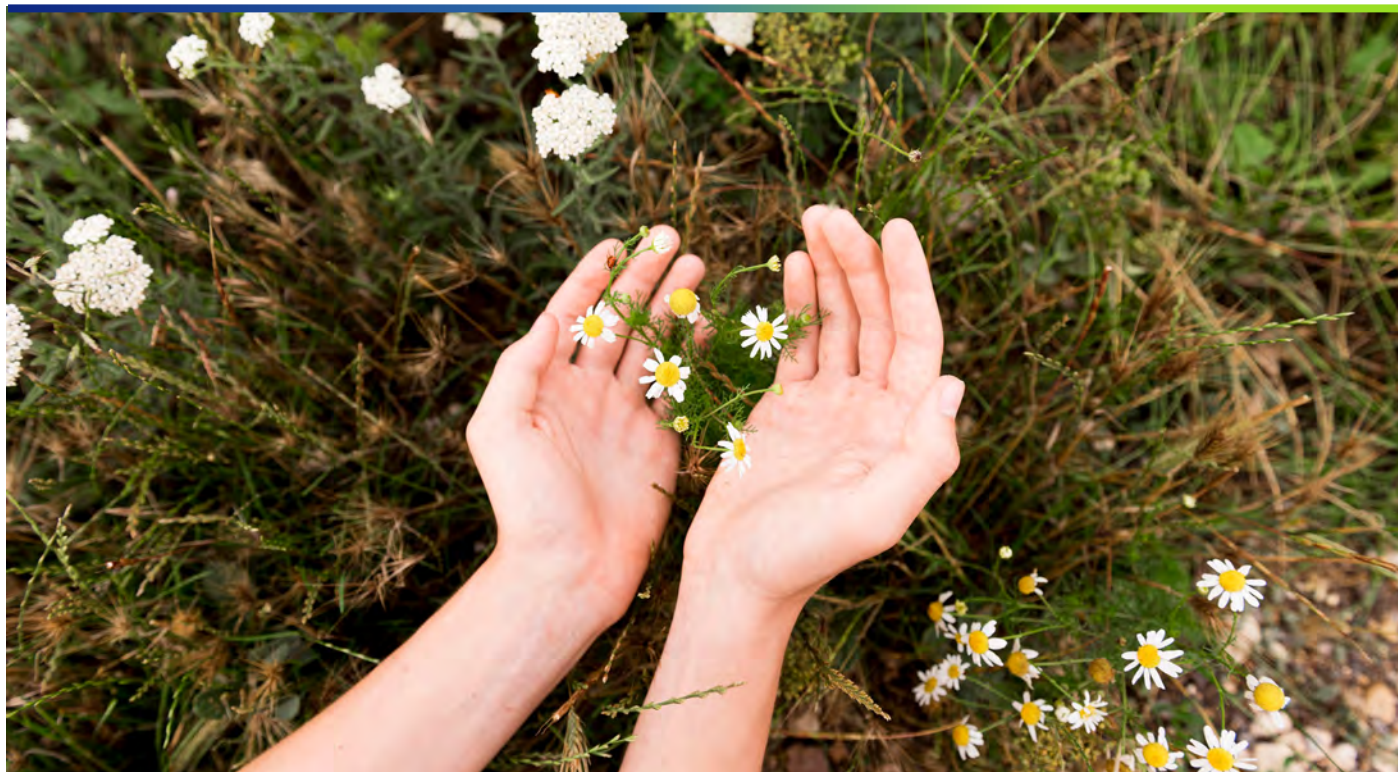
In most cases new technologies and practices are seeking to displace existing, incumbent providers of goods and services who will fight hard to avoid any loss of revenue or market share. These fights will play out in the regulatory realm (e.g., through extensive lobbying), through the media, where new practices or technologies may be cast as being ineffective or even risky, or other venues. Either way, entrenched interests are unlikely to bow out serenely from a market they have come to dominate, and these competitive dynamics and the challenges they pose for new entrants are not readily captured through comparisons of individualized project costs.

These kinds of challenges are more effectively incorporated into standardized additionality assessments where one considers sector-wide dynamics when developing the methodology. Project-by-project additionality assessments, especially those based on financial additionality, with their reductive approach to comparing projects, do not readily take the above considerations into account. For example, in tropical forests, project-by-project additionality assessments are not well suited to considering the fact that there are entrenched, and more often than not, armed and dangerous criminal organizations working to exploit the forest and at the same time exert pressure on communities to not report or take action against illegal logging or mining activities. It is incredibly difficult to put fear and intimidation into an IRR calculation.

In the agricultural sector, there are a number of elements that are not easy to capture when applying a typical additionality assessment. For instance, intermediaries who buy a farmer's produce can exert tremendous pressure to maintain the status quo. Likewise, providers of tilling equipment and fertilizers will surely tell farmers dreadful stories about the risks related to adopting regenerative agricultural practices. And yet, it is incredibly difficult to quantify the exact impact of these pressures when trying to reduce the evaluation to a simple number that attempts to compare two different outcomes.

In many ways we have a David vs. Goliath situation across a number of sectors of the global economy, and a purist approach to additionality, largely reliant on financial additionality, fails to take into account some of the most important challenges new technologies and practices face.





The Basis for a Future Model Already Exists

There are a number of bright spots that can lead the way towards a more effective way of assessing additionality. Specifically, the Climate Action Reserve (CAR) pioneered the use of positive list approaches for determining additionality,^{3,4} and these were subsequently adopted by the California Air Resources Board (CARB) as it developed its Cap-and-Trade program. The VCS Program, for example, added further guidelines that have resulted in a number of standardized methodologies, and positive list approaches became an important part of the small-scale project framework under the CDM.

Meant in part as a way to avoid some of the problems that were plaguing most of the CDM projects at the time (e.g., perceived subjectiveness of the process, lengthy review times, backlogs), these new methodologies have been developed on the basis that additionality should be determined on whether the project activity is common practice or not. This approach is both much more simple and significantly more workable given that projects have to simply demonstrate that they meet the eligibility criteria set out in the methodology, rather than having to prepare long project descriptions filled with justifications as to why the project would not have happened but for the existence of carbon credits and the finance they enabled.

³ While positive list approaches were first proposed by the NGO community as a rule for the CDM during the Marrakech Accords, they were meant as a filter and not as a stand-alone test for additionality.

⁴ While some programs such as CAR refer to positive list approaches as "performance methods", I have chosen to use the term "positive lists" both because I think the term describes the concept better and because it is important to distinguish between positive lists and performance benchmarks, which integrate both the determination of additionality and the baseline within the accounting methodology.

Despite the fact that the predominant approach for assessing additionality continues to be the project-based approach enshrined in the additionality tool, the institutions responsible for developing methodologies need to continue to drive the development of standardized approaches for a number of reasons.

- **Build on existing model.** As mentioned above, we already have a working model that streamlines the project approval process. There are a growing number of positive list approaches in the market, as well as the development of performance benchmarks. We need to continue pushing for these crediting frameworks so that we can continue to build confidence in this approach.
- **Develop corresponding approval procedures for standardized methods.** Even though there is an increasing number of standardized methodologies being developed and used, some programs have yet to develop the corresponding procedures that would enable streamlined project reviews. In other words, some programs are spending a tremendous amount of time and effort developing standardized methodologies, but have yet to develop the approval procedures that would enable projects to follow a much more streamlined review and approval process. Without such corresponding procedures projects using standardized methods don't necessarily get to avoid the lengthy, time-consuming and costly approval process. This is the equivalent of paying for the Lightning Lane option at Disney Parks but not being able to go to the front of the line.⁵ While this may be due, at least in part, to ongoing concerns about integrity, the perception or understanding that all projects using appropriately-designed standardized methodologies need a full, in-depth review is not adding much value from an integrity perspective.
- **Technology is transforming MRV.** Technology, big data and artificial intelligence are starting to address many of the concerns behind carbon accounting. Remote sensing technology, for instance, is making tremendous strides in measuring above-ground biomass, which will make the MRV process considerably simpler and enhance transparency. This could very well leave our existing conception of additionality and the review process we have built around it as the sole remnant of a dated approach.

⁵ This system used to be called Fast Pass but was replaced with the Lightning Lane option which is similar but not exactly the same.

Conclusion

The market needs to move away from the project-based approach to additionality and the incredibly complicated review process that it requires. This is especially true for projects that are already using standardized approaches and where a deep dive into a particular industry in the review process is unnecessary. In these cases, GHG programs need to make sure the methodologies are robust, and both they and auditors should be checking key elements of projects (e.g., eligibility criteria). However, the heavy lifting should be done through the development of the (standardized) methodology. Once that is done, there should be a way to ensure streamlined approval processes.

The dominant construct of additionality that the market relies on today was developed more than two decades ago when the market was in its infancy and was designed to help achieve targets within compliance mechanisms. This construct has served to build the market to what it is today, but the market needs to move beyond it, both because this approach simply cannot scale and because the scope of the challenge has changed drastically. The world has largely failed to tackle climate change, which means we need to significantly scale investment in activities that reduce or remove GHG from the atmosphere by orders of magnitude.

We therefore need a new paradigm altogether that moves us beyond the current model and enables carbon markets to serve as a catalyst for the transition of key sectors of the global economy. If carbon finance is going to serve a bigger purpose, it needs to be redesigned to support the green transition and therefore achieve the targets set out under the Paris Agreement.

The next chapter looks at how to create this new paradigm with a detailed look at an alternative approach for assessing additionality that builds on many of the innovations that are already operational in the market.

Chapter 2

Rethinking Additionality



Background

The first major obstacle any project seeking carbon finance faces tends to be related to additionality – would the project have been built were it not for its ability to generate an additional revenue stream through the sale of carbon credits? As simple as this question may sound, it is difficult to answer with absolute certainty. The reason is because the correct answer resides in a world that never comes to pass – the counterfactual scenario. This means that participating in carbon markets requires accepting some limitations on having to be 100 percent sure about everything.

Despite the fact that carbon markets stakeholders have collectively spent and continue to spend untold numbers of hours and resources trying to solve for additionality, the market as a whole has never effectively questioned the underlying premise outlined in the additionality tool. There have been some bright spots, for sure, including at CAR, CARB, the CDM (small-scale projects), Verra's rules on standardized methods and some innovative approaches at other standard-setting bodies. In addition, most additionality assessments do already consider sectoral characteristics (e.g., is the activity common practice?). However, the project-based approach to additionality enshrined in the additionality tool continues to be the dominant model for assessing this complicated concept.





We can change the construct, though, and rather than continuing to ask whether a project would have been built but for the existence of carbon finance, or whether the project makes more sense economically when compared to the alternative (i.e., applying financial additionality as the key criterion), we can change the focus towards a more forward-looking and inspiring objective. For example, we could instead ask a different question:

How can carbon finance be used to introduce new climate-friendly technologies and/or practices (or both) to the degree that is needed before the subsidy (i.e., carbon finance) is removed and thereby enable the transition of that particular sector of the economy?

The sections below propose a new framework for thinking about additionality, as well as some of the limitations to this approach and the implications of this proposed solution.

Theory of Change Needed

As mentioned in Chapter 1, one of the key weaknesses of carbon markets today is that they do not effectively set out the point at which carbon finance is no longer necessary to enable the ongoing evolution of the sector. Specifically, the dominant rules and requirements that govern the assessment of additionality do not clearly identify when carbon crediting should stop, leaving that question to be determined on a reactive basis by auditors and GHG crediting programs as they assess each project that gets submitted for registration. While this approach may yield emission reductions and removals one can stand behind, it means having to untangle additionality on the fly without a coherent vision of a deeper and more enduring objective.

The market could be more purposeful if it were to be proactive and get in front of this challenge, by establishing a coherent theory of change that is backed up by robust data and analysis. When considering the transition of a specific sector of the economy, this could mean identifying the point at which the sector in question is likely to “flip” or reach its **Positive Tipping Point (PTP)**, meaning that no additional carbon finance is needed, and future project activities will operate on their own. Another term commonly used to describe this is the *flywheel effect*, where small changes add momentum to create sustained growth. All of these concepts have at their core the bigger picture, which could serve as the guiding framework for channeling finance through carbon markets.

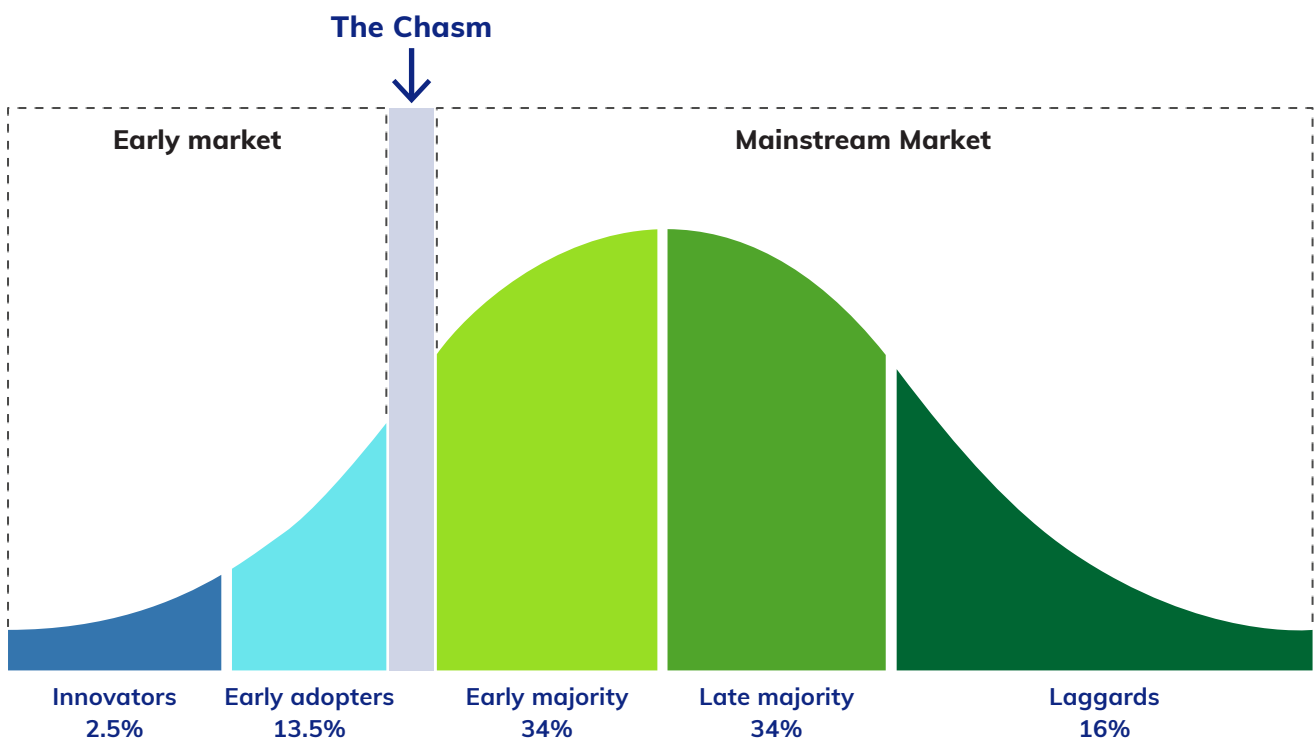
There are a number of theoretical frameworks one could rely on. One approach that seems promising is based on the now famous work done by Everett Rogers, an American communication theorist and sociologist who studied how individuals and groups adopt new technologies. Dr. Rogers started this work by looking at how farmers in the US Midwest adopted new and better corn seeds. As a result of his research and observations he originated **Diffusion of Innovations theory** which standardized how new technologies and practices permeate throughout sectors of the economy.



Dr. Rogers concluded that populations tend to break down into segments: Innovators, Early Adopters, the Early and Late Majority (of adopters), and the Laggards. More importantly, he quantified the proportion of each category relative to the whole population, setting out how new products enter the economy and end up becoming common practice, eventually reaching mass adoption. Much subsequent research has broadly validated Dr. Rogers' theory and, in some cases, the numbers behind it, beyond the farming community. Indeed, this concept continues to be used to understand how best to introduce technologies to new markets.

Geoffrey Moore built on Rogers' theory and wrote *Crossing the Chasm*, which focused on the significant challenges products face in going from early to mainstream markets. This divide tends to happen between the Early Adopters and the Early Majority, once a technology has penetrated at least 16 percent of the market. According to Moore's research, this is a particularly difficult barrier to cross. Figure 3 below illustrates key features of this important and powerful work.

FIGURE 3. DIFFUSION OF INNOVATIONS THEORY AND THE CHASM



Source: <https://smithhousedesign.com/models-predicting-future-geoffrey-moores-crossing-chasm/>



These theories may hold some lessons for carbon markets. First, they suggest that many of the market penetration limits currently being used (e.g., five percent) for some positive list approaches are far too low for ensuring that entire sectors adopt new practices or technologies. Specifically, these insights suggest that setting the market penetration threshold at levels that are too low may end up short-circuiting the natural evolution of a new market solution.

This makes intuitive sense. At low market penetration rates, it may be unlikely that proponents of new practices or technologies have addressed many of the barriers to adoption, such as measurably reducing costs of production, building

the necessary technical capacity, and sufficiently socializing the innovations to overcome initial fears and concerns. In general, low market penetration rates may not sufficiently de-risk further investments in the sector.

Diffusion of Innovations theory has been applied to numerous economic sectors, including the adoption of technology and how regulations permeate governments. In the context of carbon markets, this particular theory makes sense for those activities that have a positive long-term economic outlook but face overwhelming barriers at the outset. This is in some ways the classic application of the idea behind Diffusion of Innovations and the concept behind PTPs and its application to carbon markets – introduce a potentially economically viable product or practice into a market, subsidize it through the early stages so that it overcomes key barriers (e.g., high production costs, challenges regarding distribution and maintenance), and at some point it should stand on its own.

This type of thinking could help shift how the market thinks about additionality, especially in respect of those activities that have the potential to become economically viable over time. Indeed, these activities are precisely the ones that can transform entire sectors of the economy on their own, and do not require further support or government intervention. Examples of project types that might fit in this category include biochar, sustainable concrete, clean cookstoves and regenerative agriculture, all of which may need assistance in the early days of implementation, but eventually should be able to stand on their own.

Limitations

An approach that creates methodologies built around a theory of change based on the Diffusion of Innovations leaves unanswered the question about what happens to projects that do not generate sufficient non-carbon revenues on their own to cover the costs of implementation or ongoing operations once they come to the end of their crediting periods. In other words, there are some project types where the end of carbon finance could spell the end of the activity altogether, thereby undermining efforts to achieve the green transition. Examples of these project activities include those that solely capture and destroy industrial gases and methane (but do not produce heat or electricity or sell the methane). This risk could also apply to forest conservation projects that are not geared towards or are incapable of generating sufficient economic gains on their own.

The solution to this problem is not straightforward and could include a number of potential solutions, including involving governments in the design of carbon market interventions. In these cases, for example, governments may be willing to accept investment today through carbon markets in particular sectors of their economy and, in exchange, commit to regulating GHG emissions from those sectors in the future. Another solution could include the creation of trust funds that would be funded throughout the carbon project's lifetime and then be used to underwrite project activities once the

project can no longer generate carbon credits. The next chapter in this series tackles this particular situation.

An exception to this are those projects that generate removals, which are likely to have long-term value because the world will need these types of credits in order to meet reasonable climate targets, most of which revolve in some way around reaching global Net Zero.⁶ While one could argue that these projects simply belong in the “economically viable” category, it may be worth separating them out to better understand how one might craft the end game for these projects, if there is one. Examples of these project types include forest rewilding efforts and engineered removals such as Direct Air Capture (DAC).

⁶ Under a Net Zero 2050 scenario, the world reduces GHG emissions by a significant amount (on the order of 90-95 of today's emissions) by 2050 and then compensates for the residual emissions yearly through removals credits, which draw down atmospheric carbon. Most estimates suggest that there needs to be substantial scaling of removals credits if the global economy is to meet a Net Zero 2050 target, meaning that removals credits should have long-term value in and of themselves.



Implications

There are important considerations to think about when pursuing an approach that would rely mostly, if not entirely, on standardized approaches designed around a theory of change based on identifying PTPs that would then enable the types of transitions the world needs to address climate change.

- **Upfront investment.** The development of standardized methodologies tends to be considerably more complicated and requires more time and resources than the development of a methodology relying on the additionality tool. This is because these methodologies require the gathering of significant amounts of data and lots of research into the ins and outs of a particular sector of the economy. While the development of standardized methodologies will require patience, it would provide more confidence to investors who would have the ability to deploy capital at scale given they would know at the beginning that a particular project type would be additional until a clearly defined milestone is met. In addition, this approach would result in one in-depth analysis of a particular sector (at the beginning), and therefore avoid the multiple iterations of this exercise required when using the additionality tool for every single project.
- **Differentiation important.** It is unlikely that a one-size-fits-all PTP or market penetration threshold will work for all sectors or be applicable across all countries or even regions. This means that developing these standardized methodologies will require taking into account the circumstances and details of each sector, including any differences across borders or even regions within a country.
- **Gradations over time may be necessary.** Standardized methodologies, by virtue of having an overview of the evolution of the sector, can consider how to wean the market from a dependence on the sale of carbon credits. As it stands, the current approaches to assessing additionality, including most of the standardized methodologies currently in use, create a cliff at which, all of a sudden, projects are no longer additional, creating massive uncertainty for investors. Instead, a standardized methodology could include, for example, discounts on the volume of credits awarded to projects towards the end of the time when new ones are being approved. Under a framework whose objective is to ensure a transition of the particular sector, the reality is that the first entity to adopt a new technology or practice will face very different market dynamics than those that come much later. It therefore stands to reason that gradations may be appropriate.

- **Regular reviews.** Any standardized methodologies would need to be reviewed on a regular basis. To begin, any methodology that identifies a PTP will need to monitor how close the market is getting to that point, especially if there are gradations built-in to the methodology that require differentiated crediting. Transparency in respect of the progress being made towards the PTP will also be critical as it will help stakeholders assess their ongoing involvement in the market. In addition, the logic and fundamentals of any standardized methodology will need to be reassessed over time to ensure it continues to deliver integrity.
- **Resources needed.** The development of standardized methodologies that have at their core ensuring transitions of sectors of the economy will require significant resources. This would include, for example, conducting academic research that is based on practical experiences with the introduction of new technologies, as well as a determination of whether and how these technologies were able to gain a foothold and become widespread. This research could also include understanding failures to achieve broad adoption, which may provide unique insights into the process and the challenges faces.

Coordination to Promote Sustainable Development

Creating standardized methods that would enable the transition of entire sectors offers a tremendous opportunity for collaboration between GHG crediting programs, on the one hand, and governments, multilateral agencies and philanthropies, on the other. While the focus of GHG crediting programs has been exclusively on carbon accounting, governments, multilateral agencies and philanthropies tend to focus on fostering strong economic development opportunities. These two objectives can be brought together to create powerful frameworks that can drive sustainable economic development.

This is a great opportunity for philanthropic, government and multilateral agency funding, especially if this support is linked to the follow-on financing needed to scale activities in a particular sector. For example, the introduction of LFG capture and power generation technology through the sale of carbon credits could be coupled with large-scale infrastructure investments designed to upgrade a country's waste management systems, to include the construction of modern and properly operated landfills. This would then set the stage for the further development of future LFG power generation projects that do not rely on the sale of carbon credits because the technology has already been introduced, local capacity has been built, and generally speaking, investment has been de-risked.

- **Potential limitations on crediting opportunities.** It may not be possible to develop an appropriately-designed standardized methodology for some sectors. For example, there may not be sufficient data in a particular sector or country to develop one. As a result, this could limit the number of crediting options, although this could also force limited funds to flow to sectors where transitions are possible.
- **Leadership opportunity for GHG crediting programs.** A move towards standardized approaches that lead to the green transition would provide GHG crediting programs with a powerful thought-leadership opportunity.
- **False positives still possible.** Positive list and performance benchmark approaches to testing additionality do not completely remove the possibility that some of the reductions or removals that are approved may not be truly additional. This could occur, for instance, where the individual/entity would have adopted the innovation anyway. As mentioned above, those involved in this market need to accept that achieving absolute certainty on everything is simply not possible.

Early Adopters and Not Losing the Forest for the Trees

Positive list approaches and performance benchmarks raise the thorny issue about whether to reward those early adopters that embraced the innovations before the carbon crediting platform was introduced or the intervention was blessed through the approval of an accounting methodology. While a purist interpretation of additionality would suggest the need to exclude these early adopters, viewing this question through the lens of enabling a sectoral transition could very well yield a different result.

Excluding early adopters of a particular new technology or practice from benefiting from this new market sends an extremely negative signal to that particular sector, which could backfire and undermine trust overall. This is particularly true in sectors where decisions are heavily influenced by peer-to-peer learning and the establishment of trust, such as the farming sector. In these cases, the exclusion of what turns out to be the thought leaders of the community can put a significant chill on engagement and undermine further adoption of the promising new alternative.

In other words, when making the rules for approaches that run the risk of including early adopters, keeping the broader objective in focus is critical. While it may feel great from an environmental purity perspective to exclude early adopters, this could very well stop momentum and undermine the overall objective – a classic case of losing the forest for the trees.

Conclusion

It's time the carbon market revisits how it assesses additionality. The construct that dominates the market today was designed more than two decades ago when the objective was to find an emission reduction or removal that could be used to compensate for an emission elsewhere. That served the market well, and still does, if that is what one wants to achieve. However, the climate challenge the world faces today is more urgent and much greater. There is therefore a desperate need to revamp and refine the tools we are using to fight climate change at scale, and if the carbon market intends to play a greater role in climate action, it needs to consider updating how it assesses additionality.

Tackling this will require overcoming inertia. One of the main reasons the market has continued to rely on this original construct is because the additionality tool has made doing so all too easy. First, the additionality tool is eminently flexible and can accommodate all project types. Second, even though the additionality tool is flawed in some fundamental ways, it has an inherent logic to it. Third, it has been approved. Finally, it exists. Taken together, this means that when faced with the thorny question of how to assess additionality, the simplest and easiest route to doing so is to “pull the additionality tool off the shelf”.

There are a number of reasons why the market needs to rethink additionality. Among the most salient are the backlogs that are the result of a cumbersome, costly and time-consuming approval process, the disenfranchisement of stakeholders from the global south, and the fact that it often fails to capture critical challenges faced by new technologies and practices as these are introduced to new markets.

Perhaps most critically, all of the approaches for assessing additionality, including the standardized approaches already in use, fail to plan for the time when carbon finance is no longer needed or appropriate. The market needs to contend with the fact that revenues from the sale of carbon credits must come to an end at some point, which means that projects cannot depend on this source of finance forever. Instead, the market should be relying on this source of finance to build the foundation upon which the sector can further evolve. As such, any accounting methodology should, as a matter of course, establish the conditions under which it should no longer be used and future projects can succeed on their own without having to sell carbon credits.

A forward-looking approach to additionality would address many of the current challenges facing the market. Certainly no tool can solve everything, but we have within our grasp the ability to develop new methodologies that can become lynchpins in the green transition.

As one first step, I am currently working with Tim Lenton and his team at the [University of Exeter](#) to find resources to support a broad-based research effort conducted by students and researchers at multiple universities around the world to study this challenge and come up with concrete proposals. Specifically, we are aiming to develop a coherent theory of change for carbon markets based on PTPs that is underpinned by robust data and research from different sectors and project types. This work would determine what the adoption curve may look like for selected project types by country or even region as a way to demonstrate the concept. Appendix A sets out the concept note for this work.



Chapter 3

Embracing Government Participation



Background

This chapter considers how to ensure long-term transitions for those project types that may not have an underlying economic rationale to sustain them in the long run. Without a non-carbon source of revenue, these projects could end up shutting down once they can no longer issue carbon credits because there is no money to cover ongoing investment and operational costs. In many ways, these projects (e.g., those that destroy industrial gases) tend to be highly additional because without carbon finance they simply do not get implemented. Nevertheless, these projects are not likely to play a role in the green transition unless we figure out how to ensure they continue operating in the long run.

One of the obvious solutions is government intervention, and I strongly believe that the time has come to revisit the fact that carbon markets have never really embraced such participation. Under the CDM, project developers courted governments but only insofar as this led to the required Letter of Approval (LOA) needed to register a project with the United Nations Framework on Climate Change (UNFCCC); it is not clear whether that transactional approach will change much under Article 6 of the Paris Agreement. Under the VCM, project developers generally avoid engaging governments altogether for fear that they will interfere with project development and implementation.

This somewhat dysfunctional relationship has led to considerable pushback by some governments, and has resulted in proposed legislative and/or regulatory proposals that seek to address many of the existing concerns. For example, some governments have proposed or put in place regulations governing benefit sharing with local communities. Many other governments have put in place broader regulations, including taxes on transacted credits. If we are to consider carbon finance as a tool that could enable large-scale transitions within sectors of the global economy, the market would do well to consider embracing broader government participation.

Shifting Sands

There are several reasons for rethinking the role governments can play in respect of carbon markets.

- **Increasing pressure to act.** The landscape for government action on climate change, and carbon markets in particular, has changed drastically. When carbon markets first started to sprout, the Kyoto Protocol was the governing framework, and only industrialized countries faced pressure to control their GHG emissions. The Paris Agreement, with its bottom-up, all-hands-on-deck approach changed the underlying dynamics, creating pressure for all governments to step up. The continual updating of Nationally-determined Contributions (NDCs) and the Biennial Update Reports (BURs) required under the agreement are clear examples of how governments face pressure to take action. In addition, other international agreements such as the **2030 Targets** agreed under the **Convention on Biological Diversity** put additional pressure on governments to deliver tangible action in respect of biodiversity, much of which can be achieved through thoughtful carbon management (e.g., forest conservation and restoration).
- **What is the end game?** As outlined above, not all projects will be able to stand on their own once the carbon finance comes to an end, such as some of the LFG projects I developed under the CDM which have been mothballed. Unfortunately, this is the plight of numerous projects that depend on carbon finance for operational costs. Carbon finance is a great tool, but we cannot expect it to last forever, and therefore must prepare for the day this source of finance comes to an end.
- **Enforcement is key.** Government enforcement of laws and regulations may be one of our main hopes for effectively stopping some of the practices that are leading to massive emissions of GHGs, such as the wide variety of illegal activities (e.g., timber, mining, and agricultural production) that are destroying the world's forests. Carbon finance can certainly go a long way towards providing important resources that can help with underlying challenges (e.g., providing salaries for community members to patrol the forest), but projects will often run into situations where enforcement of laws is required. For example, only the government has the ability and authority to sanction people who are illegally tearing up the forest to look for gold. This is also true in more delicate situations, where, for instance, settlers who refuse to abide by project guidelines developed in conjunction with government requirements (e.g., to conserve a natural protected area) may need to be removed. Jurisdictional REDD has great promise to forge a model that embraces government participation.

Show Me the Money

Calling on governments to take action on climate is easier said than done, especially considering that doing so tends to require resources. Developing country governments face a particularly daunting challenge given they are called upon to increase their climate ambition while needing to support their populations' need for life's basics (i.e., food, shelter, health) with limited resources. This becomes even more challenging when they have to contend with increasingly severe impacts from climate change impacts they did not cause. That's a tall order, and carbon markets can help, if structured properly.

One of the missing ingredients in our current thinking about carbon markets is that we have not yet envisioned how they can truly help governments overcome key challenges they face when considering how to set and meet increasingly ambitious targets and be part of the green transition. Indeed, there are currently no frameworks that leverage carbon finance as a tool to build the infrastructure needed for a sustainable future that also recognizes governments have limited resources today. Even jurisdictional-based REDD programs, which are the most advanced form of collaboration between carbon markets and governments, are premised on governments putting capital at risk first, which belies the fact that they most often do not have extra money sitting around given the many pressures they already face.





One model that is worth exploring would entail governments taking on commitments to regulate GHG emissions in certain sectors of their economy in the future in exchange for investment through carbon markets today. This approach could address some of the key challenges governments face when considering regulating GHGs.

- **Reducing costs.** Much like I proposed in the previous chapter, carbon finance can help introduce new climate-friendly technologies and practices, reduce costs and build local capacity. Recognizing that some projects may not be able to sustain themselves on their own after the carbon finance ends, early investments made through carbon markets could ensure lower costs to governments in the future. For example, carbon finance could pay for new equipment and the necessary training, and thereby enable governments to pick up the ongoing maintenance and operational costs which will be significantly smaller than starting from scratch.
- **Political cover.** From a political standpoint, imposing GHG regulations is never easy. However, a well-structured approach that allows governments to reap benefits in the short term (i.e., by encouraging foreign direct investment in the economy) while committing to future climate action in the future could establish a powerful formula for tackling this challenge.

In short, carbon markets have the potential to build the kind of foundation forward-looking governments could benefit from while accelerating action on climate change.

Limitations to the Paris Agreement

Despite the relative success and popularity of the Paris Agreement, it is important to recognize that there are some limitations to the architecture it sets out. For one, there is a desperate need for immediate action on climate change, particularly if we consider the time value of carbon emissions and the fact that putting in place measures to tackle GHG emissions today will have long-term climate benefits. Unfortunately, not all of the funding promised through the framework of the Paris Agreement has been delivered. Furthermore, because most of it will come from public sources, it will take a long time to deliver action on the ground given these resources will have to wind their way through complicated and time-consuming processes required by most governments and multilateral agencies.

In addition, there is an inherent contradiction between the expectation for countries to submit increasingly ambitious NDCs and the trading framework set out under Article 6 of the Paris Agreement. In particular, the rules set out under Article 6 require host countries to issue Corresponding Adjustments for each tonne of carbon traded. This is important to maintain environmental integrity (i.e., to avoid double counting), but at its core a Corresponding Adjustment represents an opportunity cost because in order to meet any targets it has set for itself the host country will have to find an emission reduction elsewhere in its economy. As a result, countries are disincentivized from taking on increasingly ambitious targets; doing so reduces any headroom they may have in their baseline and undermines their ability to make Corresponding Adjustments. In short, trading under Article 6 may not be the panacea many consider it to be.

This could be one of the reasons we continue to see a lack of ambition reflected in many NDCs. Even the flexibility that allows countries to set out both conditional and unconditional targets under their NDCs has resulted in muddled and unclear distinctions that continue to undermine efforts to increase ambition.



Ensuring Government Accountability

A framework that enables carbon finance to make early investments in exchange for long-term regulation by governments leads to the obvious question about how to ensure governments take the necessary action down the road. This is certainly not easy to ensure, but there are working models that could inform how to structure these interventions. Multilateral development banks, for example, have long supported governments with financial instruments in exchange for concrete action on policies and regulations. This approach is also a key ingredient for funding from organizations such as the [Green Climate Fund \(GCF\)](#).

NGOs too have developed useful models. One of the most sophisticated of these is [Project Finance for Permanence](#) developed by the [World Wildlife Fund](#). Under this approach, investors create a bridge fund designed to help the government gradually assume the full cost of conserving a particular forest or region over time. In order to draw on the fund, governments need to meet performance-based milestones.⁷

Carbon finance could be leveraged to super charge efforts like these. As in the case of the Project Finance for Permanence approach, such a model would require agreed milestones for government actions that would be met over time. In the case of abandoned oil and gas wells leaking methane, one could envision governments welcoming investments to plug such wells through the sale of carbon credits and committing to a timeline that set out, for example, the following:

- **Years 1-3:** Drafting legislation to require plugging;
- **Year 4:** Passing such legislation;
- **Year 5:** Designing the financial instruments (e.g., taxes, fees) that will support implementation of the new law;
- **Year 6:** Creating an institution to enforce the new law; and
- **Years 7-10:** Building the institution, which would develop the capacity to identify, test and track methane from leaky wells and entail gradually taking over much of the work being done by carbon projects, including undertaking new well-plugging activities that will no longer be covered by carbon finance.



⁷ <https://www.weforum.org/agenda/2023/07/climate-finance-pfp/>



Similar commitments could be envisioned for other project types. In the case of forest conservation projects, these milestones could include building a cadre of forest rangers that would eventually take over the wide range of activities being undertaken by carbon projects, including patrolling the forest and building fire breaks. While these types of activities are often already being taken into account through jurisdictional REDD programs, a long-term government commitment to protect a certain area of forest would strengthen the case for further investment in REDD projects, thereby

strengthening forest conservation efforts and contributing to the proper nesting of individual projects within jurisdictional frameworks.

Of course, any government commitment will likely require resources, which would set up a constructive discussion about whether carbon credits should be taxed, and if so at what rate. While this discussion is already ongoing, it would benefit from considering whether the ultimate objective is to achieve a deeper transition. Certainly this would reframe the debate away from any tax as being purely punitive, and it would also foster a deeper discussion about how to use those revenues to achieve said transition.

Another option that is worthwhile exploring is the creation of trust funds managed by either governments or independent third parties to underwrite the project activities out into the future, after the revenues from the sale of carbon dry up. Such trust funds have been used effectively to fund long-term projects while also ensuring the resources are used responsibly. These two solutions (i.e., carbon taxes and trust funds) could work well together, with revenues from carbon taxes invested in trust funds that will backstop project interventions once carbon finance ends.

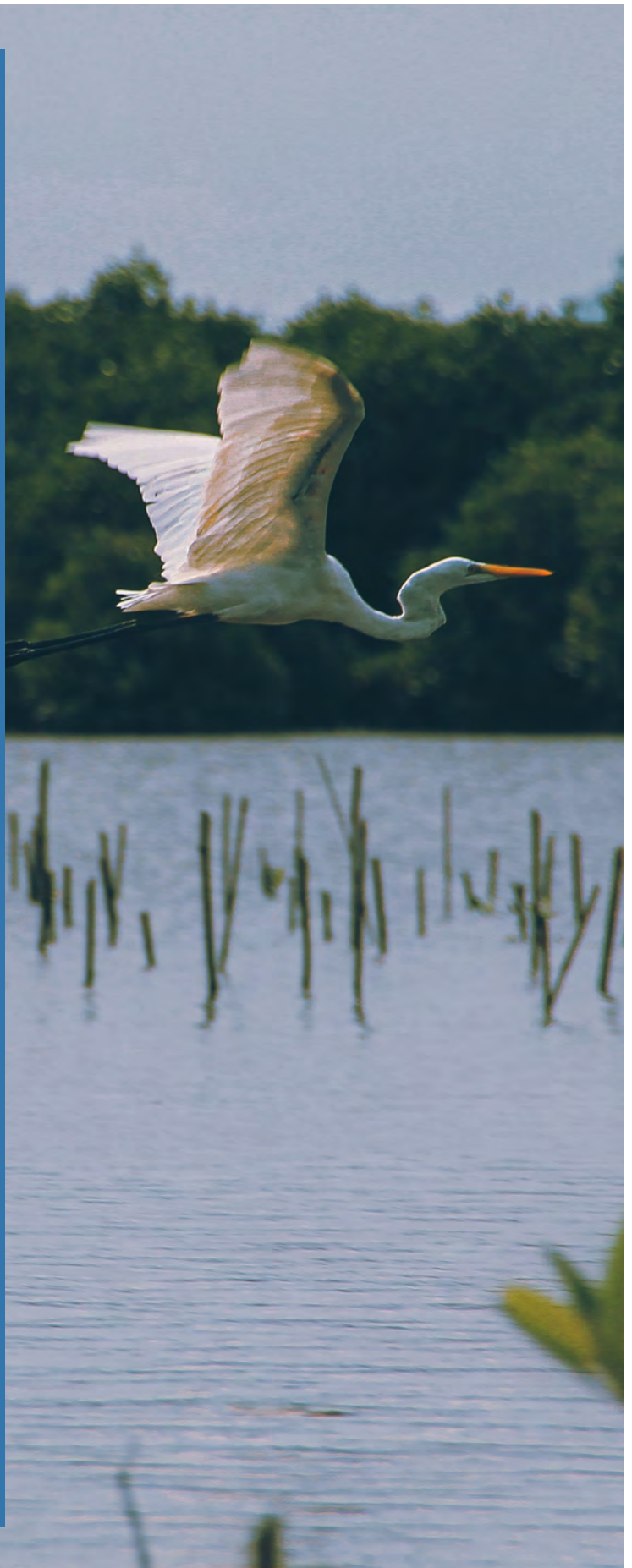
Implementing any of this will not be easy, nor is success guaranteed. There are plenty of examples where government involvement has led to failure, or changes in government have resulted in reversal of policies (e.g., Brazil and deforestation). This is always a risk, but I do not believe that we should shy away from trying this just because this risk (of reversal) exists, particularly if this can be managed by careful monitoring of commitments and agreed-upon milestones. In addition, the introduction of new technologies or practices, along with the employment and revenues they can generate, should build a constituency that will make future governments think twice before unwinding this progress.

Government Approvals and Positive Lists

A key consideration for implementing a plan like this relates to the approvals needed, which would be essential to ensuring such a plan works. Unfortunately, government approvals for carbon projects under the CDM were not always easy to obtain. For example, governments often lacked the resources to readily review individual projects. The higher stakes related to Article 6 transactions (given that agreeing to a Corresponding Adjustment means needing to find an emission reduction/removal elsewhere) will likely heighten the need for review and therefore increase the time needed to properly review each request.

One potential solution would mirror the proposal made in respect of relying on positive lists for determining additionality. Rather than having to approve every individual project, a government could instead indicate that certain project types are approved, as they would be under a positive list approach. For example, a government could welcome the development of all LFG projects in the waste sector, in exchange for committing to regulate that sector in the future. Likewise, a government could approve all projects that are implementing technologies to capture and destroy industrial gases.

This approach could also benefit natural climate solutions (NCS). For example, a government could designate a large area of tropical or mangrove forest that is both under threat and has been subjected to deforestation in the past as a candidate for a new national park, thereby encouraging individual project investments today that could contribute to the protection and restoration of the area over time, until the government is able to ensure its long-term protection.



Benefits of Long-term Government Regulation

To a large extent, government commitments to ensure the longevity of project interventions would put governments in the driver's seat, enabling them to structure frameworks for investments in their economies. As it stands, governments generally have little or no say in respect of project activities financed through the carbon markets, especially the VCM, which can create a random assortment of project investments that are not integrated into a broader development strategy. In an ideal world, all project investments should be aligned with the steering function only governments can provide.

Long-term government commitments to backstop project interventions could have tremendously beneficial impacts for natural climate solutions (NCS). Specifically, such commitments would:

- **Help address concerns about permanence.** By adding another structural element that would address permanence, this would provide market stakeholders with more confidence that the interventions are leading to long-term nature conservation and/or restoration. In a nutshell, this approach would alleviate the pressures for buffer mechanisms to do all of the heavy lifting.
- **Potentially reduce buffer contributions.** A government commitment to backstop project activities would likely reduce the risk rating for NCS projects, thereby reducing the volume of emission reductions or removals that need to be deposited into buffer accounts.
- **Strengthen project finances.** Freeing up emission reductions or removals that could then be sold on the market would generate extra revenues. Some of these revenues could, in turn, flow to trust funds (per above) meant to provide the financial support needed to ensure the ongoing implementation of project activities once the carbon finance ends. In addition, it is quite possible that projects with long-term government backing would fetch higher prices in the market given that buyers would have an extra layer of assurance in respect of permanence.



A structure that generates immediate benefits for host country governments (in the form of direct foreign investment which translates into technology, jobs and training) would provide a strong incentive for them to step up. Such an approach is not likely to work everywhere, especially considering some governments may be too skeptical of the carbon markets to use them constructively. Others may not have the capacity to engage. However, there very well may be some forward-looking governments that will be able to appreciate the potential for leveraging carbon markets to help transition sectors of their economy, and in the process improve the lives of their people. In a way, this could create a “race to the top” with leading countries – the ones setting out commitments to regulate certain sectors of their economies – likely to secure the most investment.

With this framing, one could envision that host countries could make commitments to enforce and/or enact laws or regulations to stop GHG emissions, or promote removals, once carbon projects have worked through to the end of their crediting periods. Such commitments could apply to both VCM and Article 6 projects, and would mean governments can reap the benefits of investment today (for example, new technology, new practices, green jobs) while having time to both line up the resources and build the capacity and institutions they need to ensure regulation in the long run. In short, such commitments would enable host country governments to crowd in investment into sectors they are keen to address, but for which they currently do not have resources or know-how.

Government Commitments Would Be Helpful All Around

This chapter has been focused on projects that do not have an underlying economic value other than the generation of carbon credits. However, the concept laid out here (i.e., securing a government commitment to regulate a sector of the economy in the future in exchange for investment through carbon markets today) would likely be very beneficial for all project types, including those that do have potential for being economically self-sustaining. For example, in the case of regenerative agriculture projects, a government commitment to require farmers to undertake a certain number of practices in the future would super charge early efforts to scale the market and thereby accelerate the process of reaching the Positive Tipping Point (PTP) in this particular sector.



Corresponding Commitments to Complement the Paris Agreement

In an [article I wrote for Quantum Commodity Intelligence](#) published right before COP28 in Dubai, I proposed the creation of a new concept, the Corresponding Commitment, which would entail the types of commitments outlined above and serve as a complement to the current tools in the arsenal of the Paris Agreement. The idea behind government involvement is central to the success of the Paris Agreement, so why not allow for a new tool that bridges the funding gap currently bedeviling, on the one hand, the establishment and implementation of increasingly ambitious NDCs, and, on the other, the early financing that could be provided through carbon markets?

There are a number of benefits to creating Corresponding Commitments.

- **Help bridge the funding gap.** Corresponding Commitments could be structured to help meet the massive funding gap that exists in respect of the transfer of resources from the global north to the global south, and which is necessary for the green transition. Let's recall that in Copenhagen in 2009 developed countries famously pledged to contribute US\$100 billion annually towards climate finance starting in 2020, a figure that continues to be incredibly challenging to meet on a regular basis. What if investments in project activities that are backed by Corresponding Commitments could count towards climate finance pledges made by industrialized countries? In addition to helping bridge the funding gap, this could turn into a powerful stream of investments that could be deployed rather quickly, especially when compared to the long processes required for most public sources of climate finance.
- **Incentives to support carbon projects backed by governments.** Industrialized country governments could also do their part. If investments in carbon projects backed by Corresponding Commitments count towards industrialized country pledges (per above), those governments would then be incentivized to support (e.g., through tax breaks) companies that purchase and retire carbon credits (in line with, for instance, ICVCM and VCMI guidance), essentially supercharging mitigation efforts. And, while this would not necessarily be easy politically, securing a one-time approval for new legislation may be much more achievable considering the wrangling that yearly appropriations are subject to.



The details behind all of this would of course need to be worked out. For example, fees and profits made by brokers would likely need to be stripped out of the accounting so that only on-the-ground investments are counted as pledges. In addition, any Corresponding Commitments would probably need to live on a public registry, with key milestones and progress against them set out clearly. Nevertheless, that could provide a robust platform for sharing information about commitments made and policies and regulations either designed or implemented already.

This level of transparency would address some of the shortcomings of the current system that relies only on NDCs, which can lack the specificity needed to mobilize capital at scale. In addition, if Corresponding Commitments were allowed to be submitted at any one point (as opposed to the five-year cadence of NDC submittal), they could help provide a useful stepping stone towards delivering on the promise of the Paris Agreement.

I am currently trying to put together a research effort that would look at how government commitments to backstop projects could work, including how to structure financial tools (e.g., trust funds) to ensure the longevity of project interventions. On the government side, this could include identifying countries interested and willing to make Corresponding Commitments, and preparing detailed case studies of commitments some countries may be willing to make (e.g., sectors to be regulated, milestones to be met over time, impact on GHG emissions). This could also entail preparing a formal proposal (to the UNFCCC) in respect of adding Corresponding Commitments as a tool to promote ambition and accelerate the green transition. Appendix B sets out a brief concept note for this work, including how it could link up with the architecture of the Paris Agreement.

Chapter 4

Integrating Natural Climate Solutions



Background

The new paradigm focused on using carbon finance to ensure the transitions the world needs is particularly well-suited to natural climate solutions (NCS). These solutions cover a wide range of interventions (e.g., forest conservation, restoration of degraded lands, reforestation, agroforestry, regenerative agriculture, biochar) that can create the foundation for a sustainable economy. This is especially the case when these activities are considered together, as part of a package designed to be supported at first through the sale of carbon credits but over the long-term through the development of sustainable business models.

One of the great contributions of carbon markets, especially the VCM, has been its ability to bring additional sources of finance to the protection and restoration of natural habitats. The work conducted on NCS has highlighted the importance of protecting and restoring nature and that these solutions must be part of the long-term solution to climate change. Financing NCS through the sale of carbon credits has also played a key role in highlighting the fact that carbon finance can help individuals and communities directly by enabling them to counter the economic drivers responsible for large-scale forest and land degradation. The protection and restoration of natural habitats facilitated by carbon finance has also helped stem the loss of biodiversity that is critical to healthy ecosystems.



However, some of the requirements governing parts of the carbon market limit the ability of carbon finance to usher in broader and more transformative interventions. The rules governing project and issuance approvals prevent the integration of various activities that are inherently complementary to each other. As a result, the focus on separate and individual project activities limits the potential for achieving integrated solutions and therefore greater climate action that could very well deliver the broader transition I have argued is needed. The siloed approach to project approvals in respect of NCS also undermines the development of business models that could help address concerns about the permanence of the reductions achieved. This chapter proposes some concrete changes to the rules and requirements that govern NCS financed through the carbon markets so that they can serve as a tool for the broader transition the world needs.





Landscape Thinking

The markets' rules for NCS projects need to be updated to enable more successful interventions across broader landscapes. As mentioned in previous chapters, one of the biggest challenges carbon markets face is that it is incredibly difficult to integrate the range of NCS solutions (e.g., forest conservation, reforestation, improved forest management, agroforestry, regenerative agriculture) into a single project. As a result, projects wanting to do more than one intervention have to undertake, for each intervention, the cumbersome, time-consuming and costly project development process that has become the Achilles Heel of carbon markets (i.e., preparing a lengthy project description, having that validated by an auditor and then approved by the relevant GHG crediting program).

It should therefore come as no surprise that projects tend to focus on a single activity, even though these could complement each other. For example, forest conservation projects could expand their scope of activities beyond their project boundaries to restore areas nearby through reforestation efforts and the promotion of agroforestry and regenerative agriculture, all of which would strengthen the buffer zone around the protected forest. Such integration could also help to resolve the growing divide that pits avoidance credits and removals against each other and threatens to derail very important investments we can make to protect natural habitats.

There are a number of reasons for integrating both avoidance and removals credits within a broader landscape approach, especially because doing so would enhance projects' likelihood of long-term success.

- **Complementary carbon finance.** Revenues from avoidance and removals are complementary. While revenue from avoidance can be generated relatively quickly (e.g., as soon as a project stops deforestation), revenue from removals tends to take a lot longer (e.g., until the trees grow or carbon is sequestered in the soil), which makes these projects challenging from a purely financial perspective. However, proper integration of these activities into a sophisticated revenue model would enable projects to leverage the available finance in a way that enables long-term resiliency. For example, revenues from the sale of credits related to avoided deforestation could be used to invest in activities that create removals, such as nurseries and the restoration of degraded areas nearby.
- **Additional revenues beyond the sale of carbon credits.** Revenues from the sale of forest and agricultural products can be leveraged for long-term economic sustainability, especially if these products meet emerging sustainability standards increasingly required by consumer goods and food companies. For example, produce or commodities coming from previously degraded land that now has a certain amount of tree cover would likely find its way to a supply chain looking for sustainable products and inputs.
- **Resilient business models.** Projects that diversify their sources of revenue, across both carbon (i.e., avoidance and removals together) and additional non-carbon sources (i.e., agricultural and forest products), will be more resilient because they will not end up depending on a single source of income. This is basic economics and financial management, but the rules that currently govern the market ignore this important principle.
- **Support the transition.** Projects that integrate various NCS activities can build the foundation for effective sustainable development across an entire landscape. By making investments across various project activities, these interventions can both protect existing habitats and seed the restoration of others. At scale, this could involve large investments that can build the businesses of the future.

- **Higher prices.** Projects that are more resilient and support the transition are likely to fetch higher prices in the market because buyers will appreciate that this is a long-term investment in a particular region of the world. This should be the case for buyers from the consumer goods and food industries who would appreciate the long-term benefit of ensuring the green transition. This is in stark contrast with the current model, which is primarily focused on securing tonnes to compensate for unabated emissions.

Breaking down these barriers will take some time given the methodological and program rule changes that would be required, at least in respect of the major GHG crediting programs. Some of the new and emerging standards may figure this out as well.

Nevertheless, one change that could be relatively simple and quick to implement would be to clarify or eliminate the existing rule that requires areas to be deforested for 10 years before they can be reforested. While that requirement can often be resolved with a demonstration that the area was not deforested in order to enable its reforestation for the purpose of generating carbon credits, it is broadly understood to be a barrier. We now have technology (e.g., satellite imagery) that can help ascertain where removals activities could be undertaken without creating perverse incentives. In short, while this requirement made sense back in the day, today's urgent need for removals suggests the market could simplify this particular rule to enable broader investment in removals.



Key to ensuring carbon finance can play a role in the overall transition is recognizing that removals activities tend to be better suited to generating alternative sources of income, which are critical to creating long-term value. For example, reforestation, agroforestry and regenerative agriculture all have the ability to create further value from forest (e.g., timber) and agricultural products. Leveraging those economic drivers can therefore provide a solid foundation for the evolution of this particular sector of the economy, especially if carbon finance can be reoriented to enable broader landscape management and the creation of effective and sustainable business models.

Integration Can Enable Scale

The [Tambopata National Reserve REDD Project](#) in the Madre de Diós region in Peru is a great example of what this integration of both avoidance and removals credits could look like, while also highlighting some of the challenges projects face today. In that project, the local project developer ([AIDER](#)) and its partners used the proceeds from the sale of carbon credits related to the conservation of the forest to make two powerful investments. First, they built a processing facility for locally-grown cacao. Second, they established a cooperative for cacao farmers that enabled them to benefit from the local processing facility, provided they committed to protecting the forest. Specifically, farmers had to commit to not cut down any trees in order to plant cacao, and plant cacao in areas that had not been forested for at least five years.

As a result of this simple formula, hundreds of farmers have joined the cooperative and have replanted trees on their fields, thereby generating additional income through the production of high-quality cacao, creating a strong new business platform that will help sustain the local economy in the long-run, beyond the end of the carbon project. Importantly, the areas that are now producing cacao through a sustainable agroforestry model have helped both reestablish wildlife corridors and strengthen the buffer zone around the forest reserve that was being encroached upon before the project started.

At the same time, the removals that the Tambopata Project has been able to generate have not yet been accounted for given that each of these interventions (i.e., REDD vs. ARR) requires a separate project and all of the resulting complications that go along with that. What is critically important here is that by complicating the project developer's ability to secure further sales of carbon credits, the market is undermining an excellent opportunity to transform this particular part of the economy. If the communities working on this project had extra resources to invest in additional productive activities, such as processing facilities for other sustainable agricultural products, it is possible to imagine how the sector could be transformed and eventually no longer need carbon finance.

Potential Long-term Role for Government?

The Tambopata project also serves to illustrate the power of embracing government participation, as set out in Chapter 3. The genesis for this project was a call by the national government seeking financial assistance to manage and protect various natural protected areas because it lacked the necessary resources to do so. Carbon markets stepped in and have now made a powerful contribution to protect that area. What's more, the project has helped restore surrounding areas by building a new business model based on the production of sustainable agricultural products that improve people's lives.

This model could readily be scaled to transform this particular region of Peru. For one, the government may be willing to commit both politically and financially to the long-term protection of the natural protected area, especially if the resources for ensuring the protection of this area could be secured through a trust fund that could be funded over time. In addition, the new businesses that have been built already, along with the additional ones that could be viable under a transitional paradigm, would provide new incomes for small landholders and tax revenues for the government, thereby making the scaling of these efforts an incredibly viable proposition.

The Power of Positive Tipping Points (PTPs)

If we are able to identify viable business models for activities taking place in the NCS sector, the idea of setting out **Positive Tipping Points (PTPs)** for determining additionality (as set out in Chapter 2) starts to come into focus. Specifically, carbon finance could be designed to serve as a catalyst to foster additional economic value in the form of traditional forest and agricultural products produced sustainably, leading to the long-term transitions the world needs. This means carbon finance could be used to usher in the kinds of changes needed to ensure the green transition – introducing new technologies and practices, reducing the costs needed to implement these, building the necessary capacity and, generally speaking, de-risking future investments.

Early finance provided through the sale of carbon credits could support entrepreneurs creating new businesses such as processing facilities for agricultural products, tree nurseries, and those built around training farmers to manage production with a certain amount of tree cover. A properly-designed PTP would end up creating a revamped ecosystem that would enable these activities to grow in the future on their own, without having to rely on the sale of carbon credits. For example, in a scenario where a sector has achieved its PTP, local banks would be willing to make small-business loans to a new cooperative that brings together producers of sustainable agricultural products.

Viewed through a lens that integrates various NCS activities and sets out properly-designed PTPs, one can envision how to transform the forestry and agricultural sector in states or provinces like Madre de Diós in Peru. For example, a potential threshold could represent a certain percentage of the farming community that is part of a sustainable supply chain. Achieving such “market penetration” would require the evolution of the entire sector and would likely reflect many of the key criteria needed to ensure a sustainable agricultural economy.





This highlights another key benefit of considering the concept of PTPs for determining additionality – that it would fundamentally revolutionize how investors look at this market, and investments in NCS in particular. Under the current rules, investment is rather limited, and this is due to a number of reasons.

- First, investors do not have much confidence that their investment will pay out given that there is a lot of uncertainty as to whether projects will be deemed additional.
- Second, the project-by-project assessment means investors have to wait incredibly long periods before finding out if their project will be approved.
- Third, the siloed nature of project types means investments are, by definition, limited in their scope.

Simply put, the complicated and limited nature of the siloed project approval process undermines investment in NCS.

However, under a model where a PTP has been established and results in a long-term perspective with clear guideposts, investors would have significantly more confidence in deploying their capital. Importantly, this would play out both in respect of investments made to generate emission reductions/removals, as well as with investments made in the underlying infrastructure (e.g., the nurseries, the processing facilities) needed to support a sustainable economy. The carbon market can therefore lay the foundation that can be built upon to ensure a deeper transition.

Relation to Jurisdictional Programs

The scope of the model described here will inevitably raise questions as to whether this is essentially a jurisdictional approach. Although it could be, it is not necessarily the outcome, and there are some important similarities and differences that are worth considering. In terms of the similarities, there are two main ones.

- Both are looking at interventions that would be implemented across a broader landscape than what is typically done under traditional project-based approaches. Even though most jurisdictional programs tend to be looking at national or state- or provincial-level interventions, efforts led by municipalities and/or states would more likely approximate the scope of what is being proposed here.
- Both approaches envision strong government participation. Although this is a hard and fast requirement under jurisdictional programs (by definition), close collaboration with governments can be pivotal to ensuring the success of these broader interventions as outlined in this report. For example, as explained in Chapter 3, it is likely that government participation will be necessary for the long-term protection of some natural habitats, especially those that do not have an underlying economic model to sustain them.

At the same time, there are some important differences. Specifically:

- Under a jurisdictional model, governments are the crediting entities and therefore lead the efforts to make investments, run the program and ultimately generate the credits and sell them on the market. The model presented here relies on private entities to lead the conservation and/or restoration efforts, as well as the sale of the resulting carbon credits. Nevertheless, in cases where trust funds are established to ensure long-term support for activities once there is no more carbon finance, it is quite probable that this would require an agreement between the government and the private sector.
- The point above is important as it helps to clarify a critical factor in respect of who will be taking the risk on any investments made. Generally speaking, although not always, the private sector tends to be better than governments at putting capital at risk, mostly because governments often do not have extra cash lying around that they can make risky bets with. This is reinforced by the fact that governments tend to have shorter-term time horizons due to the politics involved (i.e., the imperative to show improvements in the short term when seeking reelection).

These models are not mutually exclusive; some of the thinking I am proposing could very well be incorporated into jurisdictional programs. For instance, the concept of ensuring the transition of a particular sector within a jurisdiction could be incorporated explicitly into the design of policies and regulations to be implemented by governments working under a jurisdictional program. The idea behind a future commitment by the government to protect certain natural habitats in exchange for early financing today could be incorporated into jurisdictional programs through advanced market commitments of the type that are being made already to support jurisdictional REDD+ programs. Finally, the creation of long-term business models and the involvement of governments in the NCS sectors could lead to effective nesting of individual projects within jurisdictional programs, long considered the holy grail of forest conservation and restoration through carbon finance.

A Better Way to Address Permanence and Leakage

Another compelling reason for thinking about the broader transition in the context of NCS relates to concerns about permanence. The market has built an impressive set of solutions to address this risk, most notably buffer mechanisms. In addition, enterprising insurance companies are designing new tools to address reversal risk. However, despite how confident one may be with the resilience of the current system, there is always a risk that reversals will occur, which inevitably undermines confidence in NCS. While the market needs to continue refining and improving the rules that govern buffer mechanisms, it is also imperative that the market support more resilient and sustainable business models that directly reduce the risk of reversals.

Implementing a transitional paradigm would go a long way towards addressing the risk of reversals.

- **Reduced risk of individual reversals.** By ensuring that the interventions endure over time and become common practice, there will be a reduced risk that any one stakeholder (e.g., farmer) will go back to the previous practices. This is often mentioned as a significant risk for many NCS projects. However, if the sector reaches its PTP and therefore adopts new, more sustainable practices at scale, the risk that any one project participant will revert to previous practices is reduced. Indeed, it is quite possible that the risk of reversal is greater at lower and insufficient levels of market penetration where the early adopters may simply run out of patience and feel their “bet” is not working out.
- **Overall impact.** Assuming we enable the transition of an entire NCS sector through carbon finance, the emission reductions or removals that will be achieved beyond those that were paid for through carbon finance will more than compensate for any reversals that might occur to the initial set of reductions or removals. For example, if we assume that a PTP additionality threshold set at 15 percent market penetration ends up resulting in 60 percent of the population adopting the innovation, the climate impact of paying for that initial 15 percent would end up being three orders of magnitude greater. If a 90 percent market penetration is achieved, the climate impact would be five times greater. This means that the entire volume of emission reductions or removals achieved through the sale of carbon credits could be reversed and still be compensated for by the additional climate benefits created by the overall transition.⁸
- **Reduced buffer contributions.** Similar to government commitments that would backstop project activities in the long run, more resilient business models will likely result in reducing the risk profile of projects because an underlying business model will take over and reduce the risk of reversals. This would free up emission reductions or removals that would otherwise need to be deposited in buffer mechanisms. In turn, extra revenues these credits would generate could be used to either invest in further mitigation efforts or be dedicated to trust funds that could support the ongoing implementation of project activities once the carbon finance ends.

⁸ To be clear, I am not advocating that the market builds in a mechanism to allow for such a compensation to take place. This example is merely to illustrate that the end result of a properly designed transition will represent significantly more climate action than if we continue to focus on a limited set of actions.

The transitional paradigm would also help address concerns around leakage. Sustainable economic development opportunities built around NCS would directly counter any incentives degrade the natural ecosystem.

Strengthening Both Supply and Demand

This chapter has focused on how carbon finance for early-stage NCS investments can deliver high-quality credits to the market that support both the conservation of existing ecosystems and the foundation for a sustainable agricultural and forest economy, thereby underpinning the long-term transition of the sector. As discussed, this will require significant work to resolve some of the related methodological and carbon accounting issues. However, if these can be overcome, this could create a powerful platform for the creation of high-quality credits, especially as it could also serve to address concerns about permanence which continue to undermine confidence in this important sector. In short, applying the transitional framework to carbon finance opens up tremendous opportunities to use this source of finance to both protect and restore important ecosystems for the long term.

In addition to the above, I also believe that applying the transitional framework to NCS would strengthen demand for high-quality credits given the implications for the kinds of claims buyers can make. Specifically, investments in transformative NCS activities could generate powerful outcomes that could possibly obviate the need to track supply chain emissions down to individual producers. This is especially the case for consumer goods and food companies whose upstream supply chains come from the agriculture, forestry and other land use (AFOLU) sector and whose emissions are notoriously difficult to identify and mitigate. Certainly there are numerous efforts underway to build systems to track emissions of complicated supply chains. However, many of these systems are not sufficiently sophisticated to enable individualized mitigation efforts by each individual producer, especially in developing countries. This severely complicates the ability for companies to implement this ideal solution.

An alternative approach would be to invest in the transformation of NCS sectors so that entire landscapes are able to make the green transition. This may not be as satisfying as demonstrating that the individual farm that produced a particular input is following sustainable practices, but it is likely to be significantly more practical to implement. And still, the claim can be rather profound – that the investment is leading towards a broader transition that enables all products from that landscape to be produced sustainably. In addition, this could turn the current debate around, from a focus on compensating for one's unabated emissions to a thoughtful approach on how to drive sustainable agricultural and forest practices at scale.

Chapter 5

Carbon Credits for the Energy Transition



Comparing Apples and Oranges

Large-scale, grid-connected renewable energy projects have been a staple of carbon markets ever since the CDM approved these projects for crediting. For a long time, carbon finance helped support new and emerging technologies such as wind and solar. Even though the exact contribution of carbon markets to lowering the costs of these technologies is hard to determine with absolute certainty, carbon finance did channel millions of dollars to these new technologies, thereby playing an important role in their evolution.

Despite the apparent success of carbon markets in supporting the renewable energy revolution, the electricity sector as a whole has not yet undergone the type of transition needed to enable full-scale deployment of renewables. This is due to the fact that, for the most part, the additionality of renewable energy projects has been assessed with the original project-based approach enshrined in the additionality tool, which as set out in previous chapters, can miss important parts of the analysis.

In the case of renewable energy projects, the additionality tool essentially requires the comparison of internal rates of return between renewables and fossil-fired facilities on a “within the fence” basis. This means that the comparison stops at the edge the power generating facility, which means that it misses two critical parts of the puzzle.





- **Access to the grid.** Many renewable energy projects are much less likely to have a direct connection to the grid when compared to fossil-fired facilities. This is because renewable energy projects, especially large-scale solar and wind, tend to be located in remote areas. Fossil-fired facilities, by contrast, are generally built close to the grid. In other words, the costs to connect a renewable energy project to the grid are likely to be significantly higher than the costs faced by most fossil-fired facilities.
- **Storage.** In order to fully and properly compare a renewable energy facility to a fossil-fired facility, it is critical to take into account the need for and deployment of storage capacity given the intermittent nature of most renewables.

In a nutshell, the current construct in respect of additionality forces us to compare apples and oranges.

Positive Tipping Points for Renewables

An alternative and perhaps better way to think about crediting renewable energy projects could be to consider the need for upgrading and expanding electricity grids, to include adding sufficient storage capacity, and including those costs in the underlying financing. Normally the expansion of the grid tends to fall to a government authority, many of which are strapped for cash and are therefore unable to make the kinds of investments needed.

Previous chapters of this report have argued that carbon finance can be called on to make the early, necessary investments that can lead the green transition of particular sectors of the global economy. There is no reason this cannot be done for the electricity sector, especially considering the effectiveness with which carbon markets channeled critical finance in this sector in the past. Going forward, for example, renewable energy projects could be charged a fee that would be used to build the grid and develop needed storage capacity. The exact details would need to be worked out, but the fee could, for instance, be based on each megawatt (MW) of installed capacity, to generate early capital, and be supplemented once generation begins on a per megawatt hour (MWh) basis. Such a structure would provide confidence to other sources of capital willing to invest in this endeavor.

This approach could lend itself well to the development of a **Positive Tipping Point (PTP)** for the electricity sector. As with the PTPs discussed in Chapter 2, it would represent the point at which new renewable energy projects would not be able to generate carbon credits, noting too that until the PTP is reached projects generating carbon credits would be required to pay the fee. One key difference, though, is that a PTP for the electricity sector would be based on a determination that the grid has been sufficiently built out and there is enough storage capacity so that future renewable energy projects can readily connect to the grid and deliver their power. In other words, a PTP for the electricity sector would not depend on the ability of renewable energy projects to stand on their own; they can already do that. Instead, the PTP would reflect the investment needed to build out the grid to the point where other renewable energy projects could readily connect to the grid.

Identifying such a PTP would require detailed analysis on a country-by-country (or even regional) basis, and would be based on readily available information (e.g., projections of electricity demand, maps of renewable energy potential). Once the specific grid infrastructure needed to enable the full-scale transition towards renewables has been determined, one could then credit renewable energy projects until the threshold is met, thereby enabling new renewable energy projects to connect without carbon finance.

A key element of relying on a PTP for the electricity sector would be the need to ensure that the fee is appropriately set. Specifically, the fee would need to be sufficiently high both to enable the needed build out of the grid and to address any concerns around additionality. A low fee that is readily payable would not ensure integrity. If high enough, though, the fee could channel finance to the part of the system where it is most needed and end up facilitating the much needed energy transition.

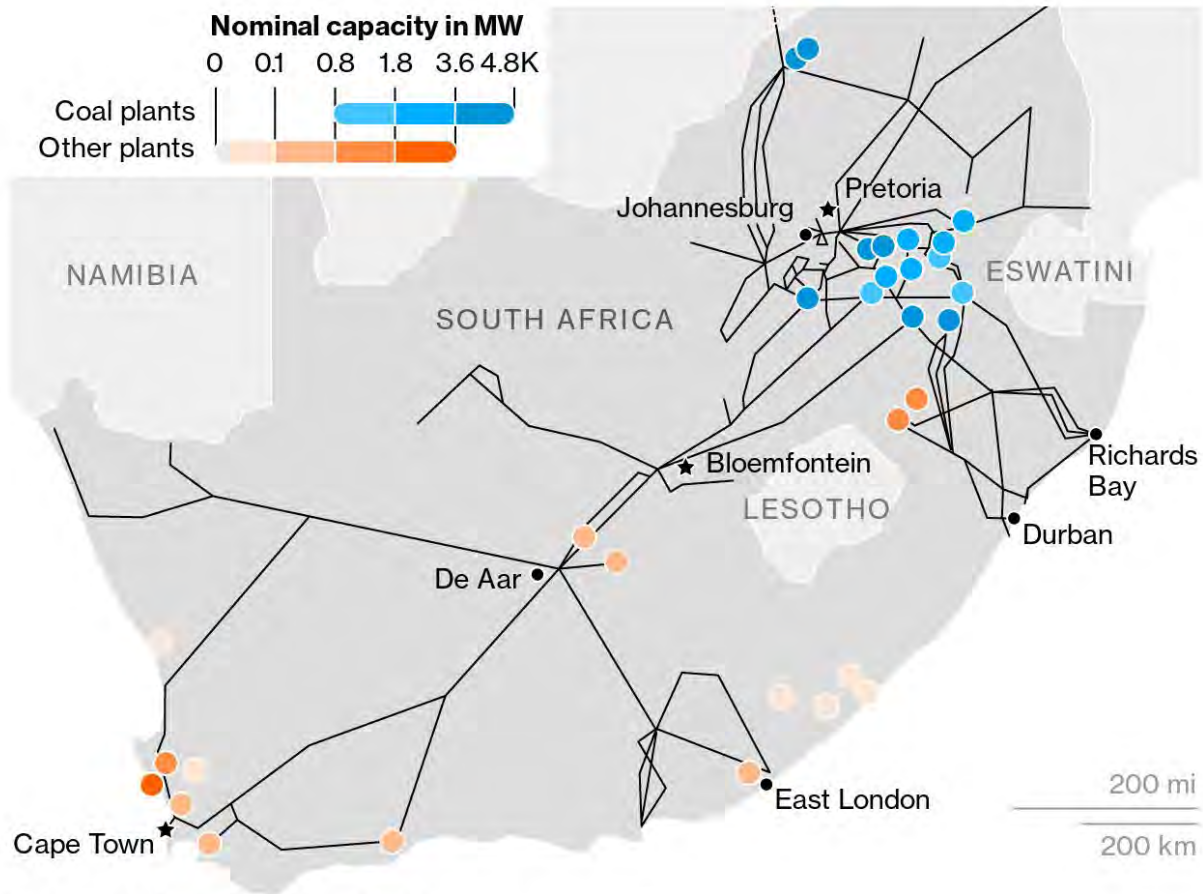


South Africa as a Case Study

South Africa serves as a good example of what a PTP applied to the electricity sector could look like. According to Bloomberg, Eskom plans to more than triple the power lines compared to what it has built in the last 10 years.⁹ This is due to the fact that South Africa’s grid was built out from the coal-rich deposits in the northeast of the country, and eventually spread to other urban centers (Figure 4 below).

FIGURE 4. SOUTH AFRICA’S ELECTRICITY GRID

Energy from Eskom’s plants—located mostly in the coal-rich northeast—travels via long transmission lines to reach the rest of South Africa.



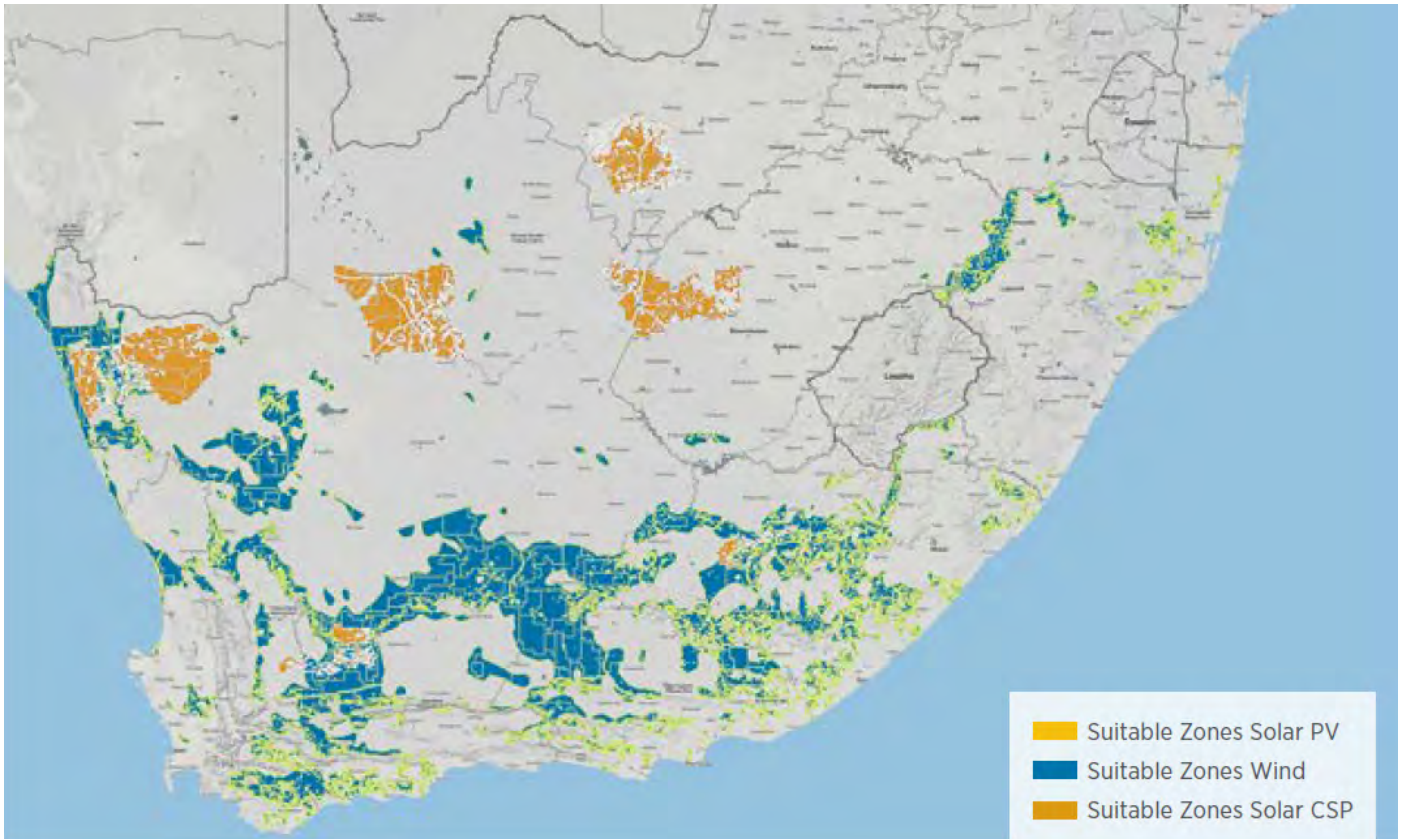
Sources: Eskom; Bloomberg data. Note: Other plants include: hydro (6), gas turbine (4), pumped storage (3), wind (2) and nuclear (1).

Bloomberg

⁹ <https://www.bloomberg.com/news/articles/2024-03-15/can-south-africa-s-eskom-meet-funding-challenge-for-electricity-grid-upgrade>

South Africa's grid, however, does not extend sufficiently to areas with large potential for renewables, like the sunny Kalahari desert that borders both Botswana (to the north) and Namibia (to the west), nor the wind rich areas in the south and southwest of the country (Figure 5 below).

FIGURE 5. RENEWABLE ENERGY ZONES IN SOUTH AFRICA



Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply an official endorsement or acceptance by IRENA.

Source: Wu et al. (2015) and MapRE database

If we were to assume that the 300 percent growth of South Africa's grid reflects the threshold at which more renewables could readily get developed because a transmission line is relatively nearby for all future projects, then carbon finance could be called on to help build this critical infrastructure. Specifically, projects that face the additional costs of financing the expansion of the grid (by paying the fee described above) could be approved to generate and sell carbon credits, and all such projects would be approved until the grid expansion is complete.



As suggested above, relying on a PTP for the electricity sector would create a positive list approach to additionality, which would in turn obviate the need to prepare long documents with detailed justifications. Instead, projects would simply have to demonstrate they meet a set of eligibility criteria to be approved/registered (e.g., Does the project's location require extensive investment in grid expansion? Can the project provide evidence that it has paid the pre-determined fee to support the expansion of the grid?).

New renewable energy projects that are contributing to the expansion and modernization of the grid through the sale of carbon credits could introduce a new source of finance to this important challenge. Indeed, it is not clear where the estimated \$21 billion needed for the modernization of South Africa's grid is going to come from given that Eskom has amassed a significant debt that required a bailout by the National Treasury which limits the utility's ability to take on additional loans.¹⁰

What is particularly interesting in the case of South Africa is that it has at its disposal a large potential source of domestic financing for this national challenge – its own domestic carbon tax, some of which can be paid by retiring approved carbon credits. The credits that are currently allowed for compliance under the program by South Africa (i.e., Gold Standard and Verra's Verified Carbon Standard) no longer approve such projects in non-least developed countries.¹¹ However, these programs could be revised, or a new program such as the Global Carbon Council which does accept renewables could be accepted, provided the requirements include the expansion of the grid and the deployment of storage capacity. In short, carbon markets, with their capacity to provide early-stage, nimble financing from the private sector could serve as a catalyst for the broader transformation of South Africa's electricity system, provided that the system is designed with the end in mind.

¹⁰ <https://www.bloomberg.com/news/articles/2024-03-15/can-south-africa-s-eskom-meet-funding-challenge-for-electricity-grid-upgrade>

¹¹ Carbon credits issued by the UN's Clean Development Mechanism are also allowed, but that framework is undergoing a transition towards the new mechanism under Article 6.4 of the Paris Agreement, which means investors may not be willing to make investments until those rules are clearer.

Renewables Revisited?

I do think that we should reconsider how carbon markets can support the energy transition, particularly in the context of crediting large-scale renewable energy projects. The greening of the electricity sector is one of the critical challenges the world faces, and it is a sector where carbon finance has demonstrated it can work incredibly well, filling in important gaps. Of course, it will be critical that the next generation of renewable energy carbon credits include in the financing equation the costs necessary to modernize the grid and provide the back-up power needed to ensure the long-term transition of the electricity sector.

As outlined above, carbon finance could be designed to achieve a broader objective and, over time, measure progress against that target. In the case of renewables in South Africa, it would be great to be able to showcase how carbon is helping to achieve a doubling and eventually a tripling of the grid. Surely there would be debate around whether the target is the right one, including whether it will be sufficient to ensure the transition. However, this would shift the debate towards achieving that broader objective instead of getting mired in debates about whether a particular project is additional or not.

The power sector also offers a unique opportunity to marry project-based interventions with jurisdictional efforts such as those being developed by the [Energy Transition Accelerator](#). Given the critical importance of greening the power sector, it is imperative that we both leverage the strengths and the weaknesses of jurisdictional and project-based approaches. In the case of renewables, for example, governments, are best placed to define the scope of the grid expansion and create the proper enabling environment. Private sector project developers, on the other hand, tend to be more nimble and effective at securing finance and making things happen on the ground.

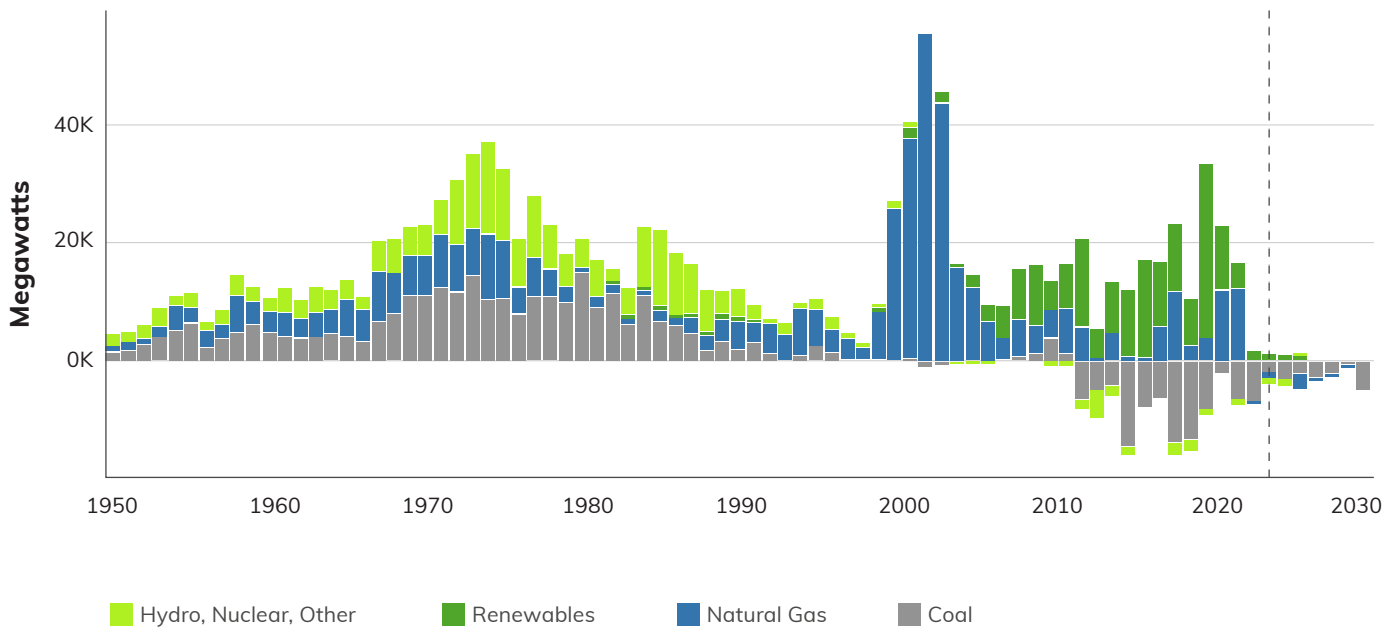


Jurisdictional and project-based interventions are also likely to tap into different pools of capital. For example, jurisdictional efforts will be able to access concessionary finance available through donor governments and multilateral development banks. The private sector, for its part, should be able to access risk capital, and its ability to do so should be enhanced if government is a partner in the endeavor.

In the end, the benefits of early investment in renewable energy projects that contribute to the modernization of the grid will not stop at the projects that generated carbon credits. The more substantial benefit of that early finance would be that it could promote the transformation of an entire sector by expanding the grid and thereby enabling future renewable energy projects to readily connect to the grid.

In the United States this transition is underway, even though there continue to be tremendous challenges to building out the grid. Nevertheless, Figure 6 below illustrates how renewables have come to dominate the construction of new electricity generating power plants in the US and what new additions could look like in other countries where the grid has been modernized sufficiently to accommodate these kinds of projects.

FIGURE 6. NEW POWER PLANTS IN THE US



Sources: U.S. EIA, University of Wyoming. Analysis by Resources and Communities Research Group at Montana State University and Headwaters Economics

To conclude, the infrastructure built through the development of renewable energy projects supported by carbon finance and designed around achieving a PTP would end up facilitating further emission reductions beyond those initial projects. In other words, every MWh that these renewable energy projects generate would be helping to lay the foundation so that future projects can readily connect to the grid. That transformation, and the resulting impacts, are worth keeping in mind as we continue to refine the role of carbon markets and think about a greater and more enduring objective.

Chapter 6

Net Zero Not Enough



Introduction

One of the drivers for thinking about how to use carbon finance as a transitional tool for the green transition came from a deeper understanding of the sheer scope of the challenge we face. Without some extraordinary intervention, and even if the world meets its Net Zero 2050 target, we are likely to overshoot the 1.5°C global heating objective set out under the Paris Agreement. Considering that the consequences (e.g., flooding, droughts, wildfires) of the warming we have already caused, which is estimated to reflect warming of around 1.2°C, going beyond 1.5° is rather terrifying, and means we need to double down on solutions.

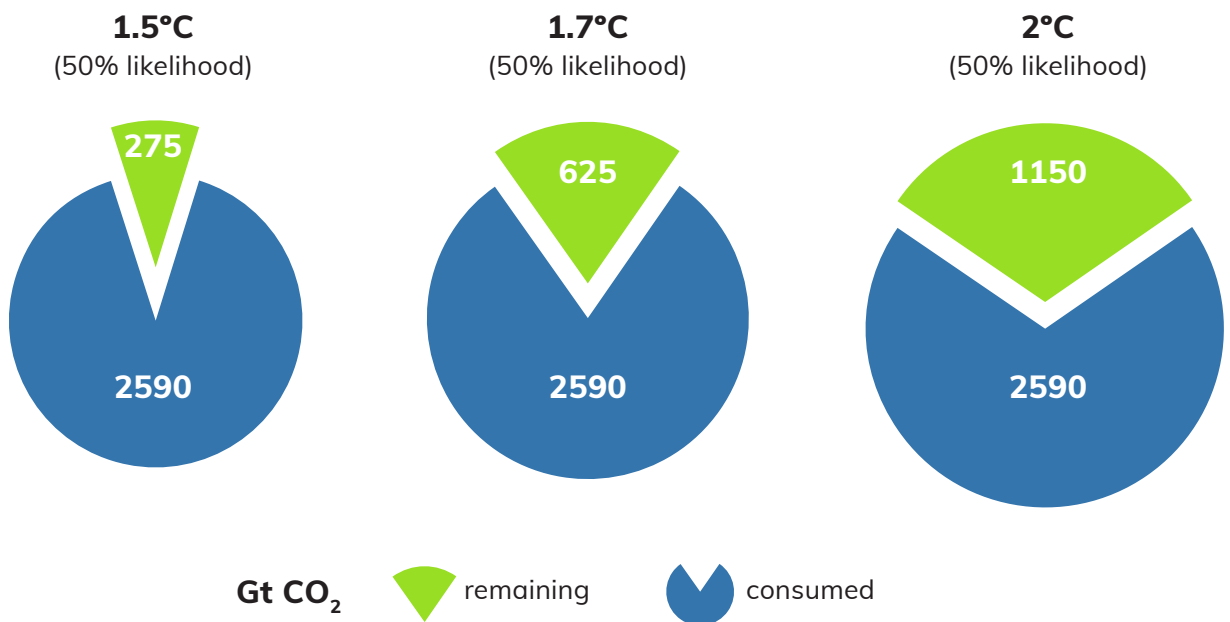
As I conclude this series, I therefore wanted to share some numbers that put some perspective on the daunting size of the emissions challenge the world faces, and which reinforces the need to ensure that carbon markets support the green transition.



What is Under the Curve?

According to its most recent report, the [Global Carbon Budget](#) estimates that we have about 275 GtCO₂ remaining in our carbon budget before we hit the 1.5°C threshold. Figure 7 below sets out the remaining carbon budgets for 1.5°C, 1.7°C and 2°C warming scenarios.¹² Considering we burned through approximately 40 GtCO₂ in 2023, that means that, without any reductions, we will consume the entire 1.5°C carbon budget in seven years, by 2031.¹³

FIGURE 7. REMAINING CARBON BUDGET



Source: IPCC AR6 WG1; Forster et al., 2023; Friedlingstein et al 2023; Global Carbon 2023

12 IPCC AR6 WG1; Forster et al., 2023; Friedlingstein et al 2023; Global Carbon Project 2023.

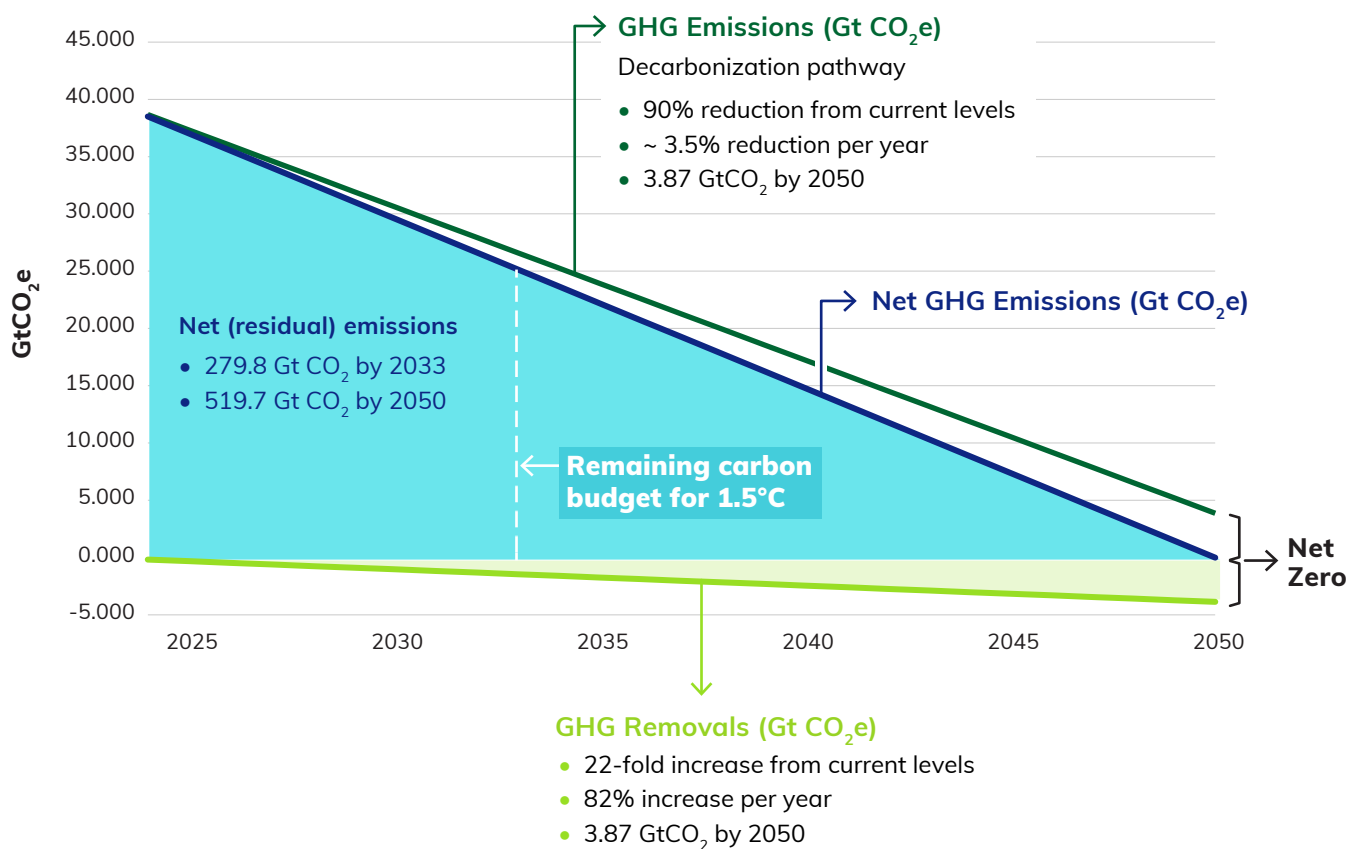
13 It is worth noting that the numbers I am using here are conservative. Other sources such as the European Commission in its [JRC Science for Policy Report of GHG Emissions of all World Countries 2023](#) indicated total GHG emissions in 2022 were 54 Gt CO₂eq, while the [US Environmental Protection Agency](#) cites data from [Climate Watch](#) indicating that 2021 emissions were 48 Gt CO₂. [The Brookings Institute](#), for its part, estimated that 2022 emissions would be 58 Gt CO₂. Using any of these figures as the starting point means we consume the entire 1.5°C carbon budget much sooner.

Even if we start to reduce emissions and grow removals, we are not likely to gain much time, at least in the short term. For example, Figure 8 below sets out a simplified curve showing a hypothetical smooth pathway towards net zero in 2050, with net emissions reflecting the decarbonization pathway and increasing volumes of removals. Specifically, the figure assumes the following:

- The world starts to reduce emissions from the 40 GtCO₂ emitted in 2023, with 2024 emissions equaling 38.7 GtCO₂;
- There is a steady decrease in emissions of 3.5 percent per year until emissions equal 10 percent of 2023 emissions (i.e., emissions fall to 3.87 GtCO₂ in 2050); and
- Removals grow steadily and eventually compensate for unavoidable emissions (i.e., removals grow to 3.87 GtCO₂ in 2050).

As the diagram shows, even with these rather optimistic scenarios, we will have consumed the 1.5°C carbon budget in 2033.

FIGURE 8. THE INCONVENIENCE OF CONSIDERING WHAT'S UNDER THE CURVE



Source: Transition Finance



Not mentioned in many of the discussions around net zero is the inconvenient truth that without any further action beyond efforts to reach net zero, which are comprised of internal reductions by companies and a growing volume of removals, we would collectively pump a whopping 520 GtCO₂ into the atmosphere by 2050. Obviously this is significantly more than the 1.5 °C threshold and starting to approximate the 1.7°C scenario set out in Figure 7. These emissions are the net residual emissions as represented by the light blue triangle that is under the curve.

Importantly, there are few mechanisms that are designed to address these “under the curve” emissions at scale and rapidly. Much of the climate finance being provided is either winding its way through complicated processes, or has not even been committed. There is a desperate need to deploy capital now.

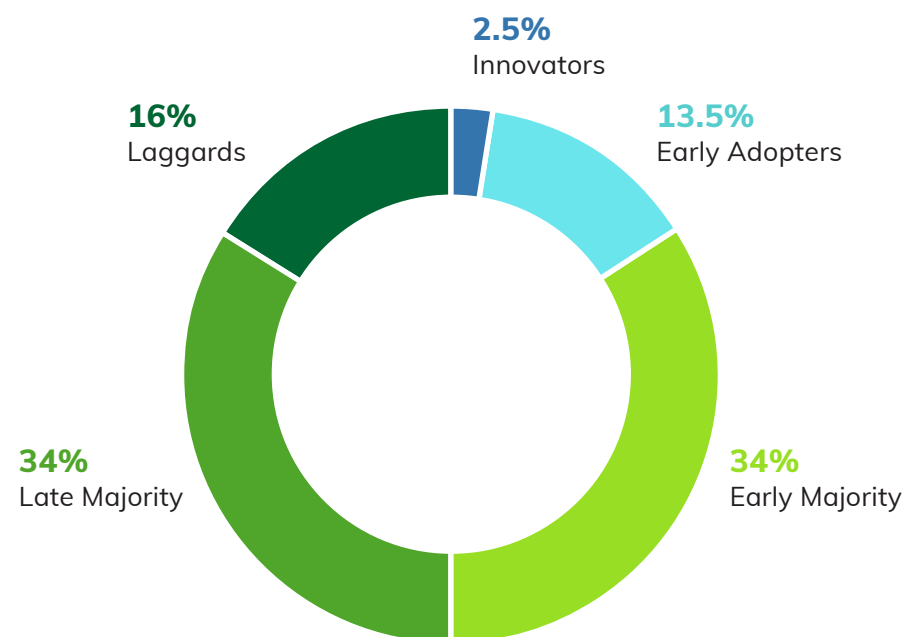
Carbon markets can help fill the gaps. Much of the basic infrastructure and foundation is already there; we simply need to change the paradigm to ensure that carbon markets are designed to ensure the green transition and channel the urgent finance that is needed in the short term.

Implications for the Transition and Addressing Net Residual Emissions

The climate impacts of enabling large-scale transformation of sectors of the global economy can be tremendous. If a particular sector of the economy is transformed through the sale of carbon credits from early interventions, then carbon markets will have catalyzed significant climate action beyond what was paid for with carbon finance.

Figure 9 below illustrates how this could happen based on the assumption that the **Positive Tipping Point (PTP)** for a particular sector, based on the Diffusion of Innovations, is set at 16 percent market penetration. In this case, carbon finance helps introduce new practices and technologies and supports Innovators and the Early Adopters embrace these innovations in the first place. Once this target has been achieved, the remainder of the sector comes onboard, with the Early Majority and the Late Majority adopting the new practices and generating significantly more emission reductions and removals than those paid for with/through carbon credits. Specifically, the Early and Late Majority end up generating 4.5 times the volumes generated by the Innovators and the Early Adopters. If the Laggards end up adopting the new innovations, the climate benefits of transforming the entire sector end up being 5.25 times greater than what was financed through carbon finance.

FIGURE 9. EMISSION REDUCTIONS THROUGH THE DIFFUSION OF INNOVATIONS LENS



Source: Transition Finance



Conclusion:
Towards a New
Paradigm for
Carbon Markets

Summary

The opportunity to enable large-scale emission reductions and removals takes us back to the underlying question: What are we trying to achieve? Perhaps more importantly, though, is what do we need to achieve given the scale of the crisis, and what then is the role of carbon markets?

For a long time carbon markets have been almost exclusively focused on the accounting for the tonnes being paid for through carbon finance. This has led to significant investment in projects introducing and implementing amazing innovations that are helping to fight climate change and in many cases benefitting individuals, communities and biodiversity. In addition, this has created a strong foundation and corresponding infrastructure.

However, given the scale of the crisis, we need to reconsider the huge potential carbon markets have for making a larger contribution. At their core, carbon markets provide early-stage capital to promising new ventures and those activities that may not be implemented without carbon finance. Nevertheless, many of the rules governing carbon markets limit their potential for driving the type of transitions the world desperately needs.

Report Highlights

In an ideal world, carbon markets would provide the financial support that would accomplish four key things:

- **Introduce new technologies and practices to sectors of the global economy;**
- **Reduce the costs of these innovations;**
- **Build the technical capacity and infrastructure needed to provide ongoing support; and**
- **Derisk future investments in the sector.**

Accomplishing the above would set the stage for the ongoing adoption of these new technologies and practices without the need for carbon finance, thereby setting in motion the type of transition the world needs. However, some of the rules governing the carbon market are not designed to achieve these key underlying objectives. To do so, the market needs to tackle the following key issues:

- **Define the end game.** The market needs to define, upfront, when carbon finance is no longer appropriate for those project types that can generate revenues on their own but need that initial boost to gain traction in the market. As it stands, the market largely leaves this decision to some undefined moment in the future, when projects are no longer considered additional. While this construct may work conceptually to ensure integrity, it is incremental and severely undermines the types of long-term investments needed to transform sectors of the economy.
- **Ensure longevity.** The market needs to figure out how to ensure the long-term implementation of projects that are exclusively financed through the sale of carbon credits and therefore currently have no other way to sustain themselves. While these types of projects may generate highly additional tonnes over the course of the crediting period, they are at risk of coming to a crashing halt when there are no more carbon revenues.
- **Streamline approval processes.** The market needs to create a more streamlined pathway to approve projects. The current model used to assess most projects creates an incredibly complicated, cumbersome and costly review process that will simply not enable the kind of scaling of climate action that is desperately needed. This is especially the case for NCS where the siloed approach to project approvals undermines investment across broader landscapes.



As I set out in Chapter 2, a good place to start is with additionality, whose original construct as enshrined in the additionality tool dates back decades and continually leads us back to making reductive apples and oranges comparisons that tend to ignore the bigger picture and undermine the ability of new technologies and practices to overcome entrenched interests. Due to the emphasis on each individual project, the additionality tool forces the market to take an incremental approach to fighting climate change, which prevents it from operating with a coherent theory of change and is essential if the market is going to achieve a deeper impact.

Chapter 2 proposed using PTPs as a way to both embed a theory of change into the additionality construct and provide a streamlined approach for project approval. The use of PTPs is most appropriate for those project types that have an underlying economic rationale but need extra support in the early stages. In many ways, these project types are the businesses of the future; carbon markets should embrace them and nurture them until they can stand on their own.

Government participation, as set out in Chapter 3, will also be key given that some activities supported through carbon markets may need regulation or additional support once the carbon finance comes to an end. What's more, carbon markets can be further designed to support greater climate ambition by countries that are keen to take action but do not have the resources today to make costly investments in new technologies and practices. There is both pressure on and interest in countries to take on greater climate ambition; carbon markets can play a critical role in supporting efforts that lead to the green transition.

Given the importance of protecting and restoring our natural habitats, and their potential to both reduce emissions and generate removals, NCS financed through the sale of carbon credits will continue to be a key part of the puzzle. As set out in Chapter 4, integrating these solutions could foster more holistic landscape management, strengthen the resiliency of projects and address concerns about both permanence and leakage from structural standpoint. Rather than having to rely exclusively on the rules and requirements to address permanence and leakage, an integrated landscape approach would enable a more effective approach to conservation and restoration by providing long-term economic and ecosystem value.

The need for a green transition is patently clear in the case of the energy sector. While the carbon market made early contributions to the development of renewable energy technologies, the reductive approach to additionality and the lack of a longer-term objective prevented it from playing a key role in channeling finance to the biggest challenges the sector faces today -- building out the grid and ensuring back up power to enable large-scale deployment of renewable energy projects. As I set out in Chapter 5, the carbon market is uniquely positioned to help solve this challenge, especially with its track record in supporting the early development of renewable energy projects.



A New Paradigm for Carbon Markets

Carbon markets are facing an inflection point that will determine whether they can grow to play a greater role in the global fight against climate change. To date carbon markets have channeled billions of dollars into climate action across a number of sectors of the global economy. Along the way, they have pioneered new ways of financing truly groundbreaking efforts that are helping to solve some of the world's most complex challenges, including developing and distributing new innovative technologies, protecting and restoring forests, and promoting regenerative agriculture, to name a few. It has done so by harnessing a nimble source of finance that can deliver action on the ground relatively quickly, all while improving lives and strengthening biodiversity.

The evolution of carbon markets has not been without its challenges, and there are several which must be overcome. I continue to be both heartened and impressed by the desire of market participants to improve how the market operates. Over the last several decades the market has built a tremendous amount of knowledge that it can draw on to inform the path forward. Much of that expertise is already being applied through initiatives like the [Integrity Council for the Voluntary Carbon Market \(ICVCM\)](#) and the [Voluntary Carbon Market Integrity Initiative \(VCMI\)](#). In addition, technology is helping to both streamline and bring transparency to these markets, which will also go a long way in addressing any residual concerns people may have.

All of those improvements notwithstanding, there is more we can do, especially considering the need to achieve green transitions across a whole swath of economic sectors if we are going to keep climate heating below 1.5°C. In order for carbon markets to support this, we must recognize that many of the tools we are using were designed decades ago and for a very different purpose than what we need to achieve now. By relying on tools that do not ensure a broader transition while also creating complex and unworkable processes we have essentially been fighting climate change with one hand tied behind our collective backs.



But we can change this. The modifications I have proposed in this report are not radical and do not require wholesale changes to the underlying basis for how carbon markets work. They simply require that we start with the end in mind, plan for the day carbon finance will no longer be needed, and design this market so that it can achieve a bigger and more enduring objective. Embracing the transitional paradigm will also lead us, at times, to draw different conclusions than what our existing model would have led us to. We should not shy away from asking these questions and instead tackle them head on so that we can continue to focus on the long-range goal and not get caught up in short-term distractions.

A concerted effort to both strengthen the integrity of the market while refocusing its objective to embrace the green transition would have a tremendously salutary effect on the overall narrative. A revamped narrative focused on enabling the green transition ought to provide a much more compelling reason for buyers to invest in carbon and for governments to play a constructive role. Importantly, it would align with many of the recent statements of support, such as the recent announcement by the [U.S. Government](#) strongly affirming the importance of the voluntary carbon market in meeting global climate goals and as part of ambitious climate action.

This report has set out a number of suggestions framed around the need to consider the green transition as we think of the next generation of carbon markets. I do believe that a transition is taking place, and my hope is that by adding a new dimension to our collective thinking we can drive additional finance to tackle climate change. In particular, my hope is that my ideas around rethinking additionality, engaging governments, breaking down barriers to NCS projects and how to credit renewable energy projects serve as a catalyst for serious discussions about how we can develop a more coherent and compelling vision for carbon markets that supports their growth and evolution into something bigger, better and more effective. We have a unique opportunity to redesign carbon markets so that they serve a greater purpose and provide a model for how to use this limited source of finance to achieve bigger and more enduring outcomes. The time to act is now.





Appendices

Appendix A

Ensuring Carbon Finance Enables the Green Transition: Linking Positive Tipping Points and Additionality

April 2024



University
of Exeter

Background

This research aims to overhaul the tools used to assess additionality in carbon markets, thereby unlocking much-needed financing to drive the global green transition. It addresses significant shortcomings in current additionality approaches that create costly red tape and hinder carbon markets from catalyzing rapid mainstreaming of key climate solutions like renewable energy, sustainable agriculture, and carbon removal technologies. By grounding additionality in a coherent theory of change based on “positive tipping points,” the work could streamline carbon finance while directing it toward projects that reach critical thresholds for self-perpetuating transformations. This would accelerate decarbonization and sustainability transitions, especially in the global south where communities face the biggest climate threats but have the least access to climate finance. Ultimately, the research stands to benefit the entire planet by mobilizing vital investments to mitigate climate change and its impacts on the world’s most vulnerable.

“Additionality” is a key concept used in carbon markets to establish that projects would not have happened but for the existence of carbon finance. Despite the importance of assessing additionality in a thoughtful manner, the tools currently used to do this have serious limitations that undermine carbon finance’s ability to fight climate change and support sustainable development.

The existing project-based and positive list approaches for assessing additionality have a number of shortcomings, including the following:

- These tools were developed years ago when the main objective was to find emission reductions/removals elsewhere to compensate for emissions generated by a company. Today carbon markets are seen with a broader lens and are imbued with the potential to facilitate the green transition, especially in the global south.

- They have created an overly costly and complicated process that is unable to scale, in part because the exceedingly long timeframes needed to approve projects and issue credits discourage investors.
- The complicated process required by the existing additionality tools create technical hurdles that disenfranchise stakeholders and communities from developing countries, effectively preventing them from being able to access carbon finance. This lack of access to funding then hampers their ability to implement sustainable development projects and solutions, thereby perpetuating energy poverty, unsustainable land use, vulnerability to climate impacts, and lack of access to clean technologies in regions already disadvantaged.
- Finally, the tools lack an underlying theory of change, and therefore do not answer the critical question regarding when carbon finance is no longer needed, which prevents the market from achieving a deeper and more enduring objective. As a result, all projects currently relying on carbon finance face the risk of reverting back to pre-project dynamics, meaning that they could fail to support an effective green transition.

There are several theoretical frameworks and strategies that could underpin new tools to assess additionality. One of the most promising is the concept of “positive tipping points” (PTPs), where a small change (e.g., strategic upfront financing to introduce new technologies and practices) leads to widespread, self-sustaining shifts to low- or no-carbon technologies or practices. Identifying and leveraging PTPs reached through carbon finance could help drive the early financing, scaling and mainstreaming of solutions like clean cookstoves, sustainable agricultural practices and direct air capture.

Carbon markets are undergoing an important transition, in part due to the severe criticism they have come under. As a result, carbon markets are taking seriously concerns about greenwashing and are putting in place safeguards to ensure integrity. The “end-to-end integrity framework” announced at COP28 is a great example of how carbon markets are working to ensure that carbon credits reflect real action on the ground and that claims made by purchasers are legitimate. Efforts by the leading GHG crediting programs to collaborate more closely will also help.

However, the current efforts to improve carbon markets tend to center around adding more rules and requirements, which threatens to make an already burdensome process even more cumbersome. Missing is a fundamental review of some of the core elements underpinning carbon markets that could obviate the need to add more rules and requirements. For instance, if carbon markets were designed with a theory of change in mind and established the point at which carbon finance is no longer needed because a positive tipping point has been achieved, additional requirements around permanence for natural climate solutions could become moot. In short, if designed appropriately, reformed carbon markets could rapidly mainstream key climate solutions and therefore accelerate the green transition.

If we fail to fundamentally rethink and reform carbon markets along the lines suggested, the potential impacts could be substantial. Without a clear theory of change and endpoint, carbon markets risk becoming endlessly complicated and mired in red tape, detracting from their ability to drive real-world emissions reductions. Lacking an overarching strategic vision, they may perpetuate the current piecemeal approach rather than catalyzing the rapid mainstreaming of key climate solutions needed to avoid environmental tipping points. This could significantly hamper decarbonization efforts and slow the crucial green transition to sustainable energy and land use practices. However, by providing carbon markets a coherent framework that includes a sound theory of change, robust metrics and streamlined procedures for assessing additionality, this work could unlock much needed finance to fight climate change across various sectors of the global economy while also supporting sustainable development. Further, it would enable carbon funding to be directed to the most vulnerable communities on the front lines of climate change, such as small landholders whose farms are extremely vulnerable to droughts and floods but who can use carbon finance to increase their farms' resiliency by transforming how they farm and enabling them to plant trees.

Research Consortium

This project would consist of a broad effort conducted by students and researchers at multiple universities around the world (up to eight) to study and develop a coherent theory of change for carbon markets based on PTPs and underpinned by appropriate metrics. The academic work done under this effort will be coordinated by the [Global Systems Institute \(GSI\)](#) at the [University of Exeter](#), a leading institution that has led the thinking on positive tipping points. Several universities have expressed interest in conducting research on this topic and supporting this effort.¹⁴

Given the large breadth of the effort, each university will work on one or more of the topics listed below, based on their individual strengths and research preferences.

1. Gaining a good understanding of the most common project types in the carbon market by conducting desk research, mostly on the publicly available registries of the main GHG crediting programs.

¹⁴ These universities include: the Universidad de Chile (Chile), the Centre for Sustainable Development Goals at the University of Los Andes (Colombia), the Centre for Economic Teaching and Investigation (Mexico), the University of Pretoria and the Centre for Sustainability Transitions at Stellenbosch University (South Africa), the Atkinson Center for Sustainability at Cornell University, the Climate School at Columbia University, and the Trachtenberg School of Public Policy and Public Administration at George Washington University.

2. Identifying frameworks used to introduce new products, technologies and/or practices into various sectors of the economy, and which can be applicable to carbon markets. For example, the private sector, governments and development agencies have all tried to introduce new technologies and/or practices and have done so based on theories of product placement and/or behavioral change drawn from disciplines as varied as behavioral economics, finance and psychology. Most of this research will consist of desk research to identify and review theoretical frameworks, although deeper dives (i.e., interviewing authors) into specific frameworks may be necessary.
3. Building out a framework based on positive tipping points and investigating the conditions that would enable positive tipping points to be reached. This would include developing a coherent objective and theory of change for carbon markets, along with appropriate metrics, especially considering the wide range of project types that the carbon markets support (e.g., renewable energy, landfill gas, clean cookstoves, reforestation, avoided deforestation). Specifically, would the threshold at which the positive tipping point is met be different for clean cookstoves than for regenerative agriculture? While most of this effort will consist of desk research, field work could add tremendous value to substantiate findings or propose specific thresholds.
4. Conduct outreach to buyers of carbon credits to socialize the new tools, in particular to avoid undermining confidence in the market.
5. Make recommendations for existing GHG crediting programs regarding whether to revamp their tools for assessing additionality, including an assessment of the advantages and disadvantages of various options.

Initial Project Types

The research will focus on project types likely to lend themselves to a PTP. Initial candidates include clean cookstoves, reforestation, regenerative agriculture and one industrial-based application (e.g., concrete with captured CO₂) to be determined.

Advisory Committee

This project would convene and seek the input from an Advisory Committee whose goal would be to support the research effort. For example, the Advisory Committee could vet proposed solutions and help develop a strategy to ensure the recommendations are taken up by the market, thereby improving the probability that this work will lead to long-lasting impact. The Advisory Committee would include forward-thinking individuals from various sectors, including private investors, carbon market experts, government representatives, NGOs and others.

Timing and Estimated Funding Needs

The project would take 12-18 months to complete and require between US\$2.5 to \$3 million, depending on the needs of individual participating universities and the preparation of a detailed budget.

Team

This effort will be led jointly by David Antonioli, Professor Tim Lenton, Dr. Jesse Abrams, and Dr. Tom Powell. David helped lay the foundation for today's carbon markets through his entrepreneurial work developing GHG emission reduction projects while at EcoSecurities and his pioneering role as the founding CEO of Verra, which under his tenure became the leading certification body in the voluntary carbon market.

Tim is Chair in Climate Change and Earth System Science and was the founding director of the Global Systems Institute at the University of Exeter and focuses on understanding the Earth as a system, modelling evolution, ecology, and biogeochemistry, tipping points in the Earth System, and identifying positive tipping points towards sustainability.

Jesse is a Senior Research Impact Fellow at the Global Systems Institute at the University of Exeter and was lead author of the Tipping Points Impacts section in the 2023 Global Tipping Points Report. His research focuses on understanding how human's impact the Earth System and vice versa. For the past two years his work has focused on creating better tools for the financial services industry to understand and address physical and transition risk due to climate change.

Tom is a Research Impact Fellow at the Global Systems Institute at the University of Exeter, and was lead author of the Positive Tipping Points section in the 2023 Global Tipping Points Report. His research focuses on positive tipping points in food and land use systems and applying social-ecological systems thinking to sustainable land-use and sustainable development in the global south.

Appendix B

Corresponding Commitments

Accelerating NDCs Through Carbon Markets

June 2024

Context

The architecture established under the Paris Agreement (PA) does not adequately support the rapid deployment of capital to ensure the green transition, which depends highly on financial support for developing countries. Despite significant pledges to provide finance, very little of what is needed has been delivered. In addition, most of the climate finance is coming from public sources, which means it will take a long time to deliver action on the ground given it will have to wind its way through complicated and time-consuming processes (e.g., the Green Climate Fund).

In addition, there is an inherent conflict between the expectation for countries to submit increasingly ambitious NDCs and the trading framework set out under Article 6 of the Paris Agreement, which means the latter is not the panacea many consider it to be. First, any trading under Article 6 means a host country has to issue a Corresponding Adjustment, which at its core represents an opportunity cost. Second, making emission reductions/removals available for trading is in direct conflict with taking on increasingly ambitious Nationally Determined Contributions (NDCs). Finally, delays in getting the Article 6 rules in place further delay the potential use of this particular mechanism.

These limitations highlight the daunting challenge developing country governments face when considering long-term commitments, such as regulating entire sectors of their economies. As a result, it should not be surprising that developing country governments have not set out overly ambitious targets. Even the flexibility that allows countries to set out both conditional and unconditional targets under their NDCs has resulted in muddled and unclear distinctions.

The Voluntary Carbon Market (VCM) is a promising source of financing. However, the VCM, nor any carbon market for that matter, has yet to fully address concerns about the longevity of the interventions it supports. There is mounting evidence that projects implemented with carbon finance may simply stop operating once carbon revenues dry up. Such an outcome would severely undermine any efforts to ensure a green transition.

Potential Solution

The PA and the VCM could be formally linked in a way that strengthens ambition, supports the green transition, and addresses some of the shortcomings of both. Because project activities implemented through the VCM do not require CAs, host countries do not have to worry about giving up their “lowest hanging fruit”. Consequently, host countries could be encouraged to commit to long-term regulation of sectors of their economies in exchange for private investment today, which could be used to introduce new technologies and practices, reduce costs, and generate the necessary capacity needed to ensure smooth operations in the long run. Such “Corresponding Commitments” would enable host governments to crowd in investment into sectors they are keen to address, but for which they currently do not have resources or know-how.

Corresponding Commitments could support the full spectrum of projects currently being developed under the VCM. For example, landfill gas projects are a great example of how governments could enable investment in technology and training today and set the stage necessary regulation in the future. Forest conservation efforts could also benefit. Governments may not be able to commit to protecting all of their forests today, but could use support from the VCM to stem deforestation and start to build the capacity needed to do so in the long run.

Proposal

This work would:

- Identify countries interested and willing to make Corresponding Commitments.
- Prepare up to five detailed case studies of countries willing to make Corresponding Commitments, setting out the details of the commitments (e.g., sectors to be regulated, milestones to be met over time, impact on GHG emissions).
- Prepare and present a formal proposal (to the UNFCCC) in respect of adding Corresponding Commitments as a tool to promote ambition and accelerate the green transition.



