



2 of 6 in the series

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

► Chapter 2: Rethinking Additionality

## About the Author

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The company's website can be found at [www.tranfin.com](http://www.tranfin.com)

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## Summary of Chapter 1

The Introduction to this series proposed that carbon markets need to be redesigned in a way that the limited finance they provide can serve as a catalyst to enable the long-term transition of sectors of the global economy. Chapter 1 framed the emissions challenge the world faces in respect of carbon finance as being the adoption of new climate-friendly technologies and practices at scale, and argued that the current rules and requirements currently governing carbon markets are not well-suited to enabling the types of sectoral transitions the world needs. This is especially the case in respect of assessing additionality, one of the key tenets that underpins carbon markets. In particular, Chapter 1 set out some of the key limitations to the dominant project-based model for assessing additionality, such as the fact that it:

- Does not effectively consider what happens when carbon finance is no longer available (e.g., will new activities similar to the ones financed initially through the sale of carbon markets be able to succeed on their own?);
- Creates a cumbersome, costly and time-consuming approval process that leads to long backlogs, depends on deep sector expertise which can be hard to find, and disenfranchises key stakeholders, especially those from the global south; and
- In respect of financial additionality, which is often held up as the best way to test for this concept, often fails to capture some of the bigger challenges faced by new technologies and practices (e.g., entrenched interests).

Chapter 1 highlighted the fact that the basis for a future model already exists (i.e., standardized approaches that include positive lists and performance benchmarks) and that these tools could be leveraged to great effect. This chapter presents some concrete ideas about how the market can rethink additionality to support the green transition, and how doing so could unlock more finance for the systemic changes that are needed.





## 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 the Climate Action Reserve (CAR), the California Air Resources Board (CARB), the Clean Development Mechanism (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 the carbon markets.

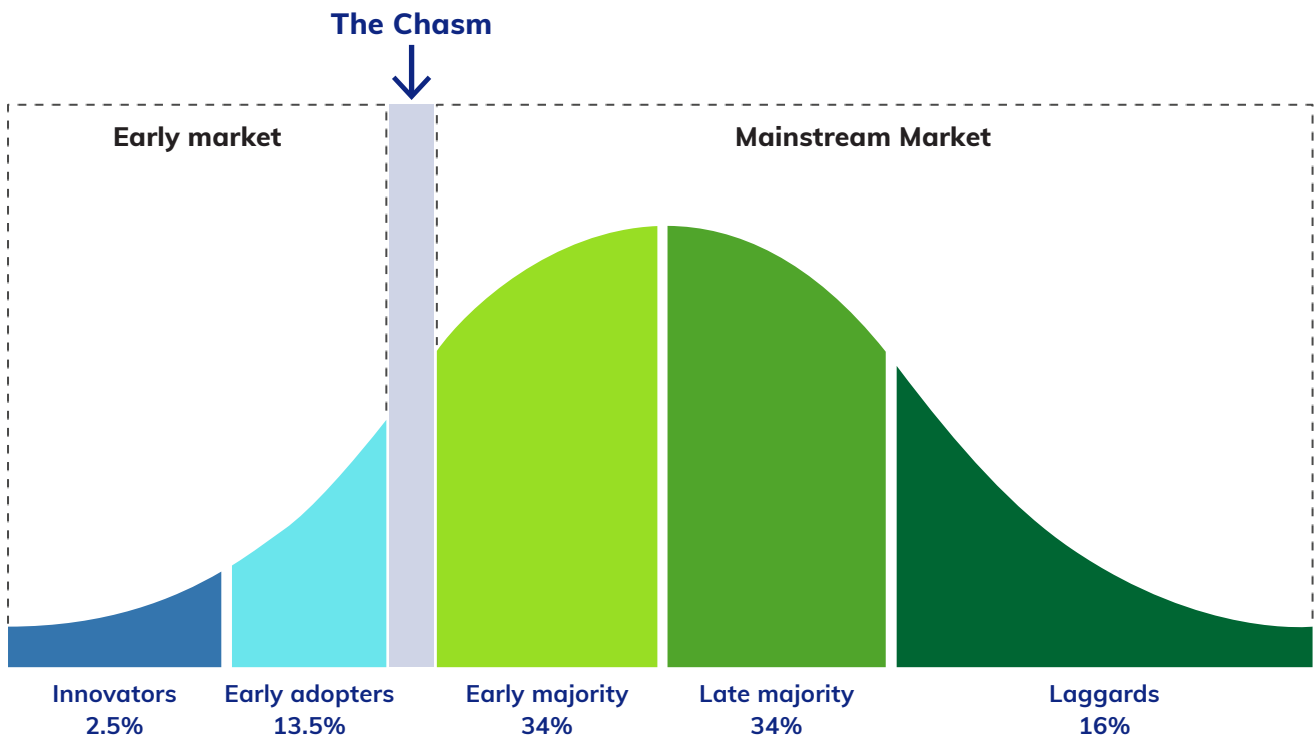
There are a number of theoretical frameworks that one could rely on. One approach that seems promising is based on the now famous work done by Everett Rogers, an American communication theorist and sociologist who studied how individuals and groups adopt new technologies. Dr. Rogers started this work 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 an 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 government intervention or support. 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.<sup>1</sup> 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).

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<sup>1</sup> 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. 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 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 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 development of future LFG power generation projects that avoid methane emissions to the atmosphere but do not require the sale of carbon credits to be profitable because the technology has already 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 traditional 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 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.

# 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.<sup>2</sup>

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.

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<sup>2</sup> 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 CO<sub>2</sub>) 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.

# Future Chapters

**Chapters 3-6 of the series will be published on a weekly basis as follows:**

|  |              |
|--|--------------|
| Chapter 3: Embracing Government Participation    | 18 June 2024 |
| Chapter 4: Integrating Natural Climate Solutions | 25 June 2024 |
| Chapter 5: Lessons for the Energy Transition     | 2 July 2024  |
| Chapter 6: Towards a New Paradigm                | 9 July 2024  |

