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Additionality

"Offsets are an imaginary commodity created by deducting what you hope happens from what you guess would have happened." (Dan Welch quoted in *The Guardian*, June 16, 2007)

The topic of 'additionality' is the most fundamental – and thus contentious – issue in the carbon offset market. In theory, additionality answers a very simple question: Would the emissions reductions have occurred, holding all else constant, if the activity were not implemented as an offset project? Or more simply: Would the project have happened anyway? If the answer to that is yes, the project is *not* additional.

Additionality makes intuitive sense: If I buy carbon offsets, I make the implicit claim that I forgo reducing my own emissions (i.e. I still drive my car) but in exchange I pay someone to reduce their emission in my stead. If I "neutralize" the emissions I caused while driving my car by buying offsets from someone who would have reduced their emissions anyway, regardless of my payment, I have not eliminated any emissions, but rather have subsidized an activity that would have happened anyway. The following example illustrates this point. The example uses offsets used under a cap-and-trade regime but the same principles apply for the voluntary market.

Scenario A:

Company A, a power producer in the UK, operates under a cap-and-trade system, such as the EU-ETS. Company A currently produces more emissions than it holds allowances for. Because of the high price of allowances Company A decides that it is more cost-effective to implement energy-efficiency upgrades in its facilities than to buy additional allowances. The company replaces its gas turbines with new high-efficiency turbines. With this upgrade, Company A reduces its emissions enough that it does not need to buy allowances to meet its quota. The cap-and-trade system has achieved its goal of inducing emissions reductions through a binding cap.

Scenario B1:

Company A decides that instead of replacing its turbines, it would like to explore buying CER credits at lower cost. Company B in China, also a power producer, is not under a cap-and-trade system, but would like to replace its old turbines, provided the company can obtain financing and access to high efficiency turbine technology. Company A approaches Company B, offering to purchase CDM credits and to transfer technology and expertise. With the additional revenue from the sale of CDM credits to Company A and access to advanced technology, Company B can now undertake the turbine upgrade. This can be considered an additional project.

Scenario B2:

Company B in China has already determined that it will upgrade its turbines, and has sufficient financing and access to suitable technology. Company A offers to partner with Company B and present this project as a CDM project, creating CDM credits corresponding to the activity that was planned to be implemented anyway. In this case, the CDM project cannot be considered to lead to any additional reductions. If it were to be registered as a CDM project regardless, it would result in the creation of credits that would allow Company A to emit more than it would have without the CDM project without having created any compensating reductions.

The calculation of the number of offsets generated by a project is inherently problematic. The key difficulty lies in the need to compare the projects' actual emissions to a counterfactual scenario reflecting another reality, one in which the activity is *not* implemented as an offset project. This scenario is referred to as the "baseline" scenario, and the number of generated credits is equal to the difference between emissions in the baseline scenario and emissions resulting from the project. There is no fail-safe way to divine what the baseline scenario would be. Various methodologies, protocols, and rules-of-thumb can be devised, but ultimately the scenario cannot be known with certainty.

Many different tools have been developed attempting to improve the accuracy of additionality testing and to reduce administrative burden on the project developer and offset program administrator. There are two distinct approaches to additionality testing: Project based additionality and Performance Standards (such as Benchmarks).

Project-based Additionality Testing

Project-based additionality testing looks at the circumstances of each individual project and evaluates them on a case-by-case basis. It is the most accurate, yet also the most labor- and cost-intensive method. The following is a short selection of additionality tests that are commonly used:

Legal and Regulatory Additionality Test

A project can only be considered additional if it is not required to fulfil official policies, regulations, or industry standards. For example, an energy efficiency project might be implemented simply to meet building codes, in which case it would not be considered additional. If the project goes beyond compliance, it might be additional but more tests are required to determine that.

Financial Test

A project can only be considered additional if it is not profitable without revenue from carbon offsets. In other words, the revenue from the carbon offsets is a decisive reason for implementing a project. The financial test is consistent with a microeconomic view of behavior, and in theory would be a perfect additionality test. But in reality there may be projects whose finances make them look non-additional, yet they may still be "additional" because of non-monetary barriers.

Barriers Test

A project can only be considered additional if there are barriers, such as local resistance, lack of know-how, institutional barriers, etc, that prevent its being implemented regardless of its profitability. If the project succeeds in overcoming significant non-financial barriers that the business-as-usual alternative would not have to face the project is considered additional.

Common Practice Test

A project can only be considered additional if it employs technologies or practices that are not already in common use. If the technology or practice is already in common use, then implementation as an offset project is presumed not to be necessary to carry out the activity.

Which test or combination of tests is best suited to validate additionality depends on the type of project. An additionality test for one type of project (e.g., a simple regulatory test for methane flaring, where there is no reason to do the project if not required by law) might not be sufficient for other kinds of projects (e.g., energy efficiency, where there could be plenty of reasons for doing a project besides complying with regulations).

Project based additionality tests often rely on information that is inherently difficult or impossible to confirm.

Performance Standards

A Performance Standard is a "shortcut" approach to additionality and baselines. It does not attempt to undertake a project-specific inquiry into a project's additionality, or to determine the specific baseline scenario for each project. Rather, it takes an approximate, aggregate approach. It establishes a generic baseline scenario against which all projects (of a given type) are assessed. This baseline takes the form of a quantitative performance standard – or "benchmark" carbon intensity per unit of output – specific to a given sector, e.g. a electricity carbon intensity in kgCO₂/kWh defined for the power sector in China. Any project with emissions below this pre-defined benchmark is automatically deemed additional, and offsets are awarded based on the difference between the project emission rate and the benchmark emission rate.

The advantage of benchmark approaches is that they are simpler and more transparent to apply. They shift the workload from individual project hosts to a centralized entity that collects the necessary sector-specific data and makes a decision about the level at which to set the benchmark. Establishing a benchmark requires comprehensive data collection and verification, as well as regular updates. The political process to approve a benchmark may take a long time and it may only be feasible for certain industries, e.g. small renewable heat and power or small energy efficiency. Benchmark approaches are attractive because they are simple to apply. They may thus reduce cost and administrative burden for the project developer. Yet the devil lies in the details.

The main problem with benchmarks is that they may be too simple and broad. They are crude tools for determining additionality, for example, if the benchmark uses an emission rate as a proxy for determining additionality, all activities whose emissions fall below the benchmark emissions are awarded credits, regardless of whether they would have taken place anyway. If a benchmark is set at, say, the twentieth percentile relative to the range of emissions performance in a given sector, then one can expect that projects amounting to twenty percent of new activity in that sector may be eligible to generate offsets, all of which would be non-additional.

Observations On Baselines and Additionality

No matter how quantitative and objective it appears, any test will create some number of false positives (i.e. projects that appear additional despite the fact that they are not) and some number of false negatives (i.e. projects that appear non-additional despite the fact that they are). The design of the test determines if it will err on the side of false positives or false negative. Deciding which is more acceptable has to be determined through a political process. It is important to understand that while false positives and false negatives both impair economic efficiency only false positives undermine the environmental integrity of offsets. In other words, it is the false positives – offsets from non-additional projects – that lead to increases in emissions and therefore hamper climate protection goals.

Additionality tests can be cumbersome, time-consuming, and expensive. They are, however, necessary, because carbon offsets from non-additional projects sold into the market will actually lead to an increase in the buyer's emissions, with no corresponding decrease in emissions from the seller, and hence a net *increase* in GHG emissions. If these projects are fully additional, then there will be a shift in emissions from the seller to the buyer, and zero net change in global emissions. The costs associated with rigorous offset programs are not merely "administrative burden" or "transaction costs" but rather production costs. They are legitimate costs associated with assuring the product has real value.

Download pdf that lists publications that criticize the CDM for its lack of additionality (compiled by Barbara Haya).



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HOW DO YOU EXPLAIN ADDITIONALITY?

JANUARY 25, 2012, BY MICHAEL GILLENWATER

If you have worked in the climate change space for very long, you have likely faced this question in one form or another. Try explaining carbon offsets to your sister-in-law and you have two choices. Either you give her a superficial response in an attempt to change the subject or you dive in and try and explain offsets. If you chose the latter, you will find it near impossible to avoid the concepts of a baseline and additionality.

Although I have done my share of dodging the question over the years, it has been the deep dive discussions on offsets (including the work we did as part of the Offset Quality Initiative) that led me to realize, not only did I not fully understand additionality, neither it seems did anyone else. (Or at a minimum any additionality experts out there seem to have serious trouble articulating their full comprehension of the topic.)

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There are, of course, lots of opinions about how impossible or complicated additionality is to apply. But it was only when I started looking into the reports and other literature, with the sole purpose of studying how additionality and baselines were addressed, that I realized we had a real problem here. No wonder people are skeptical about offsets. If you look at the climate community's own words on the subject, we don't appear to have a handle on a concept we have championed as integral to the policies we have created. Language on additionality and baselines is vague, inconsistent, or both. No two authors seem to define these concepts in the same way without falling back on some platitude like "business as usual."

Now, it is at this point where I expose a bit of my personality. I have a tendency to be a bit of a gadfly at times (some might go as far to say this time it is more of a Don Quixote complex). Would you spend several years researching and writing a paper on additionality? Well I did. And further, I wrote three papers.

(As an aside, some of the impetus for this research came out of my work comparing Renewable Energy Certificates and carbon offsets and thinking about what really justifies a claim that an activity actually reduces emissions.)

So before I go any further, here are the papers. We released an earlier version of them several months ago. Since then I have received comments from a number of you (thank you!). The versions we are releasing now incorporate the comments as well as some other improvements.

- What Is Additionality? Part 1: A long standing problem
- What Is Additionality? Part 2: A framework for a more precise definitions and standardized approaches
- What Is Additionality? Part 3: Implications for stacking and unbundling

Each of the three papers does something different. Part 1 explores how we got here. Why is additionality important and why is it such a mess. It concludes with a definition for additionality and baseline that addresses some long standing problems.

Part 2 is a beast of a paper. So be prepared. It dives deep into how to be more rigorous in the application of additionality and baselines and do so in a way that enables the development of standardized approaches. Part 2 has an element of guidance to it, but more importantly, it walks you through the theoretical questions we need to answer as a community if we are to defend offsets as a legitimate policy mechanism.

Lastly, Part 3 takes a tangent into the world of credit stacking and ecosystem services. Once you have thought deeply about additionality, then you can reflect on how to deal with cases

where you have multiple overlapping offset programs that are crediting multiple environmental benefits. As we know, many project activities produce benefits other than just greenhouse gas emission reductions.

All three papers are written in an academic style. In this blog, I am not going to try and give a complete summary of them in a non-academic style. But I will make a few points.

Defining the definitions

Hopefully, it is already clear to you that proper consideration of additionality and baselines is key to the environmental integrity of offsets. I would go even farther and say that the very concept of an "offset" requires the concept of additionality. You can't say you have offset some harm unless you can show that you "caused" some equivalent extra good to occur elsewhere. Additionality is about this causal question.

To start, we need to clarify the precise "cause and effect" we are concerned with in the context of project-level accounting for emission offsets? For us, the "effect" is the implementation of the proposed project (the effect is not the reduction of emissions...see Part 2 paper for an explanation why).

Next, we need to specify our "cause"? You can't try and predict an effect if you never bother to identify the cause with which you are concerned. Ignoring this issue is like saying:

Betsy: "Why should I trust that this offset credit is real?"

Tom: "Because, we caused the project to happen."

Betsy: "OK, how?"

Tom: "Well we don't know how, and we avoid thinking about what we did to cause it. But we know we did cause it to be implemented."

In the offset community this line of thinking is epitomized by the vacuous, and unfortunately widely used, phrase: "the project would not have occurred otherwise." This type of language is problematic because it is half a thought: Otherwise except for what?

The "cause" is the policy intervention recognized by an offset program. It might be limited to the economic incentive created by the GHG program (i.e., the risk-adjusted offset credit price signal), but it does not necessarily have to be limited as such (for why, see the Part 2 paper). The additionality question then becomes whether this intervention caused the proposed project to happen or whether there was no behavior change resulting from the intervention. How do we answer this question? By assessing whether the proposed project is

the same as its baseline, which, if so, indicates that the policy intervention had no effect. Therefore, the definition of additionality is contingent upon the definition of a baseline. And what is a baseline? Well, it is what would occur in the absence of the policy intervention, holding all other factors constant. So, again, we are back to the importance of being precise about what we recognize as the policy intervention.

The problem here is that few GHG programs explicitly specify what they recognize as their policy intervention. Therefore, they leave it to validators, project developers, and media reporters to guess and play games with what is additional. Further, and probably more importantly, their lack of specificity makes it impossible to falsify a determination of additionality. We especially need to be precise about the recognized policy intervention before we can develop standardized approaches (i.e., we have to know what we are setting a standard for).

Avoiding linguistic traps

But my biggest annoyance when discussing additionality —and a very common trap that's snared no shortage of climate policy wonks— is the circular definitions error. How many times have you read or heard someone say that additionality is about what "would occur without the project" (e.g., the Kyoto Protocol itself includes this type of language). The problem with this way of thinking is that we are trying to understand a cause and effect relationship, as discussed above. We are trying to decide if behavior is being changed. The project cannot cause itself to happen. That makes no sense. It is not the absence of the project that is the defining characteristic of a baseline. It is the absence of our recognized policy intervention. This is what is meant by circular definitions. Saying something causes itself puts you in a meaningless logical loop.

Critics will say that we can't go trying to get inside the heads of every project developer and investor and predict why they are doing what they are doing. I agree. But it would be good enough to predict what a typically project developer would do. What would a reasonable project developer do under typical conditions in this industry or country under conditions where the recognized policy intervention is absent? This is our baseline.

If we are very precise about our recognized policy intervention we can then call on critics to use more rigorous testing and analysis in their arguments rather than vague challenges. Likewise, we can provide validators and methodology developers clear guidance on what their standardized approaches are to approximate.

Another reason there is so much confusion and frustration on the topic of additionality is that most GHG protocols and standards have provided little help. Both the ISO standard and

the GHG Protocol for projects basically punted on the topic. We have gotten so used to sloppy and vague language on additionality and baselines that these non-definitions have started to sound like they actually mean something. Since no one seems to say anything that sounds carefully crafted, we assume it must be OK for us to do the same. It is a classic case of groupthink.

I know this is a challenging topic (and one that most really do not want to discuss), but it is not going away. Either, as a community, we deal head on with the conceptual challenges of additionality and baselines, or we should just walk away from offsets as a policy mechanism. I'm convinced that for us to make progress on offset policy, we first have to be far more precise in our thinking about additionality and baselines.

I look forward to hearing your thoughts and comments on my attempt to do just that.

Epilogue

Why is the GHG Management Institute publishing these discussion papers? To be clear we are not a traditional research institute or think tank. There are plenty of those already. And while we are highly cognizant of the value of research and academic inquiry (we even sponsor a peer-reviewed journal), it is not part of our mission to add to the ongoing 20+ year avalanche of policy white papers and reports. Indeed, we long ago determined that our greatest contribution comes in changing the way GHG management is taught, technical skills are developed, and the resulting practitioner class professionalizes. As we work to achieve that mission our research program selectively identifies neglected research questions we believe are key for the GHG community to grapple with for the benefit of all and to further develop ourselves professionally.

13 COMMENTS ON "HOW DO YOU EXPLAIN ADDITIONALITY?"



Sallie on January 26, 2012 at 9:02 am said:

Hi Michael, your blog entry popped into my inbox just as I was pondering how one should best communicate to others (i.e. our projects and partners) how to set baselines for NAMAs. Given the not-necessarily-offset-

The first part of the paper discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial system and for providing a clear audit trail. The second part of the paper focuses on the role of the auditor in verifying the accuracy of the records. The auditor must ensure that all transactions are properly recorded and that the records are consistent with the underlying business transactions. The third part of the paper discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial system and for providing a clear audit trail. The fourth part of the paper focuses on the role of the auditor in verifying the accuracy of the records. The auditor must ensure that all transactions are properly recorded and that the records are consistent with the underlying business transactions.