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Review

Additionality and permanence standards in California's Forest Offset Protocol: A review of project and program level implications

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ABSTRACT

A key component of California's cap-and-trade program is the use of carbon offsets as compliance instruments for reducing statewide GHG emissions. Under this program, offsets are tradable credits representing real, verifiable, quantifiable, enforceable, permanent, and additional reductions or removals of GHG emissions. This paper focuses on the permanence and additionality standards for offset credits as defined and operationalized in California's Compliance Offset Protocol for U.S. Forest Projects. Drawing on a review of the protocol, interviews, current offset projects, and existing literature, we discuss how additionality and permanence standards relate to project participation and overall program effectiveness. Specifically, we provide an overview of offset credits as compliance instruments in California's cap-and-trade program, the timeline for a forest offset project, and the factors shaping participation in offset projects. We then discuss the implications of permanence and additionality at both the project and program levels. Largely consistent with previous work, we find that stringent standards for permanent and additional project activities can present barriers to participation, but also, that there may be a trade-off between project quality and quantity (i.e. levels of participation) when considering overall program effectiveness. We summarize what this implies for California's forest offset program and provide suggestions for improvements in light of potential program diffusion and policy learning.

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1. Introduction

As important carbon sinks, forests can offer low-cost options for reducing net greenhouse gas (GHG) emissions within subnational, national, and global responses to climate change (Amano and Sedjo, 2006; Galik et al., 2013). California's 2006 Global Warming Solutions Act (AB32) provides for the use of carbon offsets from forest management as compliance mechanisms in a statewide GHG cap-and-trade program (CA, 2006). Launched in 2012 and administered by California's Air Resources Board (ARB), the program aims to reduce GHG emissions to 40% below 1990 levels by 2030, by requiring regulated emitters (e.g., electricity providers, manufacturers) to submit compliance instruments – an emission allowance or a carbon offset – for each metric ton of carbon dioxide-equivalent (MtCO2e) emitted during a compliance period.

A carbon offset is an intangible, tradeable commodity representing 1 MtCO2e emissions reduced or sequestered. In California's cap-and-trade program, offsets support flexibility, innovation, and cost containment by expanding the supply of compliance instruments (Tietenberg, 1990). Allowing offsets that do not meet quality standards, such as additionality, however, can undermine the integrity of the cap and the effectiveness of climate commitments. This is because offsets issued for forest management activities that would have occurred anyway represent non-additional GHG emission reductions that, when submitted for compliance, increase overall emissions. Opt-in provisions offering lower-cost compliance options (e.g., use of offsets) are commonly adopted in market-based environmental policies, but these provisions raise concerns about adverse selection – a circumstance where additionality tests return a false positive, classifying a non-additional offset as additional. As such, adverse selection presents significant design challenges to decision-makers adopting offset programs and offset standards as part of emissions trading programs (Bushnell, 2011; Bento et al., 2015a, 2015b; Gillenwater, 2012; Montero, 2000; Gren and Aklilu, 2016).

To ensure the legitimacy and environmental integrity of California's climate policy, offsets must be "real, additional, quantifiable, permanent, verifiable, and enforceable" (CCR, 2016, §95970). Here, we focus on two of these standards: permanence (a requirement that credited carbon reductions endure for 100 years) and additionality (that projects go above, and beyond common practice or business-as-usual to sequester more carbon). Both principles are key quality assurance tenets in regional and global mechanisms for GHG emission reduction and sequestration, such as the Regional Greenhouse Gas Initiative (RGGI) and Kyoto's Clean Development Mechanism (CDM) (Gillenwater and Seres, 2011; Valatin, 2011). Their implementation, however, is not without challenges due largely to information asymmetries and different risk preferences between participants and program administrators (GAO, 2008; Ramseur, 2009; Bento et al., 2015b; Montero, 2005; Mason and Plantinga, 2011).

In this paper, we review the implications of additionality and permanence at the project level, in terms of project participation, and, at the program level, in terms of overall program performance. We argue that there is a possible trade-off between levels, and that increased stringency of project-level permanence and additionality requirements contributes to decreased program effectiveness, understood as achieved levels of GHG reductions. To illustrate these trade-offs, we present a conceptual case using examples from California's Compliance Forest Offset Protocol. Our key insight is that by conceptualizing and evaluating offset principles at the program rather than the project level, we could potentially address some of the challenges associated with project participation. Specifically, a programmatic approach would substantially lower project-level permanence requirements and potentially increase true additionality. Similar observations about applying offset principles at the program level have been made in the context of Kyoto's CDM (Shrestha and Timilsina, 2002). However, theoretically grounded arguments and examples from subnational programs are scarce in the academic literature, which to date has focused largely on carbon leakage and less on permanence and additionality (exceptions include Bento et al., 2015a, 2015b).

This paper makes two contributions. First, we develop the literature by providing an overview of the first compliance forest offset program in the United States, its implementation, and its operationalization of additionality and permanence. Over ten years of experience with California's offset program suggests that a review can offer initial lessons for other offset programs at subnational or national levels. California's program is unique, in that it is linked to a climate change regulation, the first of its kind in the US and one of the most ambitious policies in North America (Kelly and Schmitz, 2016). Second, by proposing to (re) define and measure additionality and permanence at the program level, the paper adds value to discussions about program design and policy outcomes. While current evidence is insufficient to reliably assess outcomes, we are able to identify design features critical for program performance, specifically: trade-offs between permanence and additionality at the project level, and between stringency of project-level standards and program effectiveness.

Our review draws on an appraisal of the ARB Forest Offset Protocol, existing literature, current forest offset projects, and participant interviews. To understand the implications of permanence and additionality in the context of California's program, we read three versions of the "Compliance Offset Protocol US Forest Projects" (first approved by ARB in October 2011, with subsequent amendments from November 2014 and June 2015). We supplemented this with insights from contract theory, the literature on additionality and permanence, as well as 16 interviews with stakeholders in the forest carbon market (See Appendix for list of interviews). Finally, we developed a database of forest offset projects using data from California's Air Resource Board (ARB), the Climate Action Reserve (CAR), the American Carbon Registry (ACR), and Verified Carbon Standard (VCS). Project data were collected in October 2016 and updated in March 2017. All projects were coded by status, registry, project type, owner type, and other attributes.