



Carbon offsets out of the woods? Acceptability of domestic vs. international reforestation programmes in the lab[☆]



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ABSTRACT

Following the entry into force of the Paris Agreement in November 2016, governments around the world are now expected to turn their nationally determined contributions into concrete climate policies. Given the global public good nature of climate change mitigation and the important cross-country differences in marginal abatement costs, distributing mitigation efforts across countries could substantially lower the overall cost of implementing climate policy. However, abating emissions abroad instead of domestically may face important political and popular resistance. We ran a lab experiment with more than 300 participants and asked them to choose between a domestic and an international reforestation project. We tested the effect of three informational treatments on the allocation of participants' endowment between the domestic and the international project. The treatments consisted in: (1) making more salient the cost-effectiveness gains associated with offsetting carbon abroad; (2) providing guarantees on the reliability of reforestation programmes; (3) stressing local ancillary benefits associated with domestic offset projects. We found that stressing the cost-effectiveness of the reforestation programme abroad did increase its support, the economic argument in favour of offsetting abroad being otherwise overlooked by participants. We relate this finding to the recent literature on the drivers of public support for climate policies, generally pointing to a gap between people's preferences and economists' prescriptions.

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Introduction

Following the 2016 entry into force of the Paris Agreement, governments are now expected to turn their greenhouse gas emissions pledges into concrete climate policies. These policies need not only to be sufficiently effective to reach the emissions abatement objectives, but also to be as inexpensive as possible to leave some economic and political room for further policy tightening, in

particular when it will come to set new ambitions in 2023. Only in this way, the long-term objectives of the Paris Agreement can be met. Since greenhouse gases mix uniformly in the atmosphere, and given the important differences in cross-country marginal abatement costs, distributing abatement efforts across countries could substantially lower the overall cost of implementing a global climate policy (Morris et al., 2012; Kriegler et al., 2014).

The choice of the policy instrument is crucial to ensure that the abatement objectives can be reached at a reasonable cost. Economists contend that carbon pricing represents the central pillar of the policy package necessary to transform emissions targets into effective abatements (Goulder and Parry, 2008; Aldy and Stavins, 2012). However, important political resistance opposes the use of carbon pricing, which explains the limited diffusion of carbon taxes and cap-and-trade programmes around the world (Baranzini and Carattini, 2014; World Bank, 2017). The same resistance also applies to the use of carbon offsets resulting from activities or projects implemented abroad, but used to compensate domestic

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emissions, as well as, more generally, to the mechanisms permitting the compensation of emissions among countries (Monbiot, 2007; Schneider, 2009). For instance, the European Union (EU) Emissions Trading Scheme capped until 2013 the amount of carbon credits that firms could buy from emissions abatement projects taking place outside the EU. Since 2013, international credits are no longer accepted. Similarly, the use of international offsets is currently capped in the California cap-and-trade scheme, and international offsets may disappear altogether from this scheme as it enters the third compliance period in 2018. In the case of California, strong resistance to the use of offsets comes in particular from local environmental justice groups, which claim that firms should reduce their emissions locally, and provide co-benefits to local communities (Schatzki and Stavins, 2009; Pastor et al., 2013). The 2009 Waxman–Markey bill also included a cap for the use of carbon offsets, related to the location of abatement efforts. Domestic and international offset programmes were each capped at 1 billion metric tons, with the possibility for the US Environmental Protection Agency to shift part of the domestic cap to international offsets only if it could be determined that the domestic supply was insufficient. The room for abating greenhouse gas emissions abroad is also limited by law in other contexts. In Switzerland, for instance, a minimum of 30% of the total emissions reduction must be achieved domestically. Stronger requirements may apply for some industries. For instance, fossil-thermal power plants are required to offset all of their emissions, 50% of which must be compensated domestically.

At the same time, some countries, such as Norway, Finland, Sweden or Costa Rica, plan to become carbon neutral over the next decades, an objective that potentially implies a large use of offsetting practices. While Costa Rica plans to undertake local measures to offset emissions through reforestation, reaching this objective in Scandinavian countries would very likely require the purchase of a substantial amount of carbon offsets from foreign countries. Sweden, for instance, plans to cut its domestic emissions by 85%, while offsetting the remaining amount. This paper is motivated by the conflict between the large potential cost savings associated with abating emissions through projects implemented abroad and the possible political resistance to such practice.

Some evidence already suggests that the public may not always favour the most efficiency-enhancing solution in climate policy, even when pay-offs are transparent (Cherry et al., 2012). People may not even pay attention to the provided quantity of public good, if their motivation is impurely altruistic and driven by the moral satisfaction of contributing (cf. Andreoni, 1990). For instance, using stated preferences methods, Kahneman and Knetsch (1992) find that the willingness to pay for a public good may not be influenced by the quantity provided: individuals may not necessarily understand that different quantities of public good can be provided with the same contribution. This difference can, however, be very large, especially for environmental goods such as carbon offsets, whose costs can vary greatly depending on location.

In addition, practical reservations have been raised to the purchase of international carbon offsets. Evidence of abuses in the additionality condition have clearly contributed to reduce the credibility of the UNFCCC's mechanisms to facilitate international emissions trading, such as the Clean Development Mechanism and Joint Implementation (see Schneider and Kollmuss, 2015; Tirole, 2012). In the light of these critiques, the preference that the general public seems to give to local projects, and to standards certifying projects generating emissions offsets abroad, should not surprise (see Blasch and Farsi, 2014). However, beyond this, little is known on how to overcome these obstacles and increase the popularity of international carbon offsets.

A new literature analysing this question empirically is thus needed. Torres et al. (2015) use a choice experiment to test the

effect of distance to the mitigation site on the propensity to support mitigation activities. This stated preference study finds a preference for local mitigation, which provides local co-benefits. All potential mitigation sites are, however, located in Mexico, where the survey takes place. The international dimension, and the related heterogeneity in abatement costs, is thus left for future research. Two additional studies shed more light on the question of domestic vs. international abatements. Anderson and Bernauer (2016) recruit participants on an online labour market and analyse the effect of different informational treatments on stated support for domestic vs. international offsets. People seem to express higher support for international abatements when the argument of efficiency (vs., e.g. ethicality) is raised, even though no real carbon offsets are proposed and no real monetary consequences are present. Diederich and Goeschl (2017) recruit German participants on an online survey platform to participate in an experiment in which, depending on the treatment, they may be offered the purchase of local (EU-based) or developing country offsets. Inference is this time based on revealed preferences. In the local treatment, participants are reminded that it is in Germany, where they live, that they are generating emissions. In the developing country treatment, participants are informed that the offset projects are certified Gold Standard and will be realised in an environmentally-friendly way while providing benefits to the local population (such as jobs). The demand for these two offset options is compared to a neutrally-framed treatment (the control group), where the location of the abatement is also explicit (the EU), but no attempts to stimulate guilt or affect decisions are made. Diederich and Goeschl (2017) analyse the demand for carbon offsets across treatments and find that location does not matter. If anything, their informational treatments increase overall contributions with respect to the neutral framing. Note, however, that in all treatments, including the neutral framing, participants are informed that the climate is indifferent about where mitigation is carried out (that is, location does not matter).

Our paper also uses experimental methods, inferring from revealed preferences. We contribute to this nascent literature by focusing specifically on the allocation decision that determines how demand for domestic vs. international offsets changes depending on the information provided. Our approach thus exploits a real situation, in which there is a real difference in location and abatement costs between two otherwise similar offsetting projects. In this setting, we analysed the role of informational treatments in conjunction with the real difference in the offset price tag. In short, our experiment went as follows. We gathered about 300 students in the lab and observed how they allocated their endowment between two reforestation projects, one taking place domestically and one abroad. We provided three randomised informational treatments. The treatments mimicked the role of a political campaign trying to foster (or hamper) the political support for generating carbon offsets from reforestation projects implemented in a foreign country, instead of domestically. Two treatments played in favour of carbon offsets generated abroad by (1) emphasising the cost-effectiveness related to international projects and (2) giving guarantees on the reliability of the reforestation programmes. The third treatment stressed the local ancillary benefits from domestic carbon offset projects in terms of biodiversity, recreational activities, protection from natural disasters and local employment. We compared these three treatment groups with a control group, subject to a neutrally-framed treatment.

We found that stressing the cost-effectiveness of the international reforestation programme led to a significant increase in contributions to the latter. That is, some participants seemed to overlook the price differential, absent any specific treatment leveraging it. We did not find any effect for the other treatments. Participants seemed to already factor in the existence of local co-

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