

Ghost Credits: A Carbon Conundrum

Market-based mechanisms to combat climate change played a central role in the 26th United Nations Climate Change Conference (COP26). In particular, COP26 clarified rules regarding carbon credit markets, markets in which companies can earn credits by keeping their carbon emissions below a specified regulatory standard and can trade these credits to other firms that want to emit carbon above the standard (Mulder, 2021). This scheme is meant to ensure that emission savings used to procure credits from a regulatory agency balance out the additional emissions produced by firms that own credits. However, determining whether an organization actually saved a certain quantity of emissions is not trivial. Researchers have found that a sizable number of credits in existing carbon markets can be traced back to a systematic overestimation of carbon emission savings.

A proliferation of these ‘ghost credits’ means that a carbon market’s true emission savings are smaller than the amount indicated by the credits in the market. Hence, the credits now license firms to collectively produce more carbon emissions than are saved by firms that procure the credits, defeating the purpose of a carbon market. Given that a large chunk of credits in existing carbon markets are ghost credits, the carbon markets set up by COP26 are at risk of being undermined unless future UN meetings develop a better plan of action to stem ghost credits.

To illustrate the dilemma posed by ghost credits, consider California’s forest offset program. In this program, organizations procure credits based on carbon emission savings gained through forest preservation efforts – these credits can then be traded on the open market.

In principle, to estimate how much carbon was saved by a particular project in forest X, one calculates the difference between the carbon stock of forest X after the project and the carbon stock of forest X if the project never occurred. Since the project actually occurred, measuring the

carbon stock after the project is relatively straightforward. However, determining the carbon stock for forest *X* under the counterfactual that the project never occurred is trickier. Rather than studying individual forests to compute estimates for the carbon stock of each forest if a given project never occurred, California uses a regional average to estimate the carbon stocks for forests in a particular region if the project never happened (Badgley et al., 2021a).

While the above solution ensures that California's regulatory agency can feasibly calculate emission savings given limited resources, relying on regional averages is far from ideal. Project developers, eager to receive more carbon credits, may be incentivized to choose forests with carbon stocks higher than the regional average. The true carbon stocks in the selected forests if no projects occurred would consequently be higher than the regional average. Hence, California will be overestimating emission savings in the region, implying that the credits that California allocates to project developers exceeds actual emission savings. If done systematically across regions, California would allocate more carbon credits to project developers in aggregate than is justified by the true savings in carbon emissions.

To investigate the impact of this adverse selection effect, the nonprofit organization CarbonPlan comprehensively studied project records from California's offset program with forest inventory (Badgley et al., 2021b). Through this study, the researchers estimated that about 30% of all carbon credits arise from over-crediting in California. This systematic over-crediting means that companies owning credits can now produce carbon emissions above California's regulatory standard, therefore undermining California's offset program.

California's use of regional averages seems *prima facie* to be a sensible means of estimating emissions savings, especially when considering that California's program is the largest carbon offset market in operation (Badgley et al., 2021a). Finding an efficient way to estimate emission

savings without incentivizing project developers to make adverse choices is not simple. COP26 has not addressed this problem explicitly: While COP26 seeks to prevent double-counting by nations in a UN-backed carbon market, this does not address the ghost credits arising from adverse selection effects. Given that any UN agency responsible for estimating emission savings will compute estimates with limited resources while dealing with projects spanning the globe, it remains to be seen whether the UN-backed carbon market established in COP26 can effectively withstand the issues presented by ghost credits.

References

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