

Risk-Rating GHG Emissions Offsets based on Climate Requirements

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Abstract

To stabilize global warming within the 1.5-2.0°C Paris Agreement goal, greenhouse gas (GHG) emissions need to reach net-zero. Offsetting is required for net-zero emissions (emissions minus offsets), as achieving zero emissions is unrealistic. Offset schemes differ widely in their capacity to mitigate anthropogenic global warming (AGW). Rayer et al. (2021) provide offsetting guidelines to strengthen their long-term climate benefit, this chapter further develops this topic. We propose a framework for rating different offset types based on their climate risk, moving beyond the usual criteria of verification, audit, and additionality. We apply our offset climate ratings to some offsetting types and case studies including the sorts of schemes proposed by major oil companies, and the PAS 2060 carbon-neutrality standard. Some offsets provide little more than economic nudges towards emissions reduction. Climate offsetting requirements are more exacting. The proposed framework grades offsets from most to least benefit. Grades help classify offsets' climate risks based on: helping terminate it, slowing warming, or only offering economic incentives with little climate benefit. Ultimately, to stabilize global warming, it will be necessary for policy to encourage the highest rated offsets under the proposed framework. Reference Rayer, Q. G., Jenkins, S., & Walton, P. (2021). Defining net-zero and climate recommendations for carbon offsetting. In Walker, T., Wendt, S., Goubran, S., & Schwartz, T. (Eds.), *Beyond the 2°C: Business and Policy Trajectories to Climate Change Adaptation* (chapter 2). Palgrave Macmillan.

RISK RATING GHG EMISSIONS OFFSETS BASED ON CLIMATE REQUIREMENTS

Main Finding: Offset types differ in their capacity to address global warming and should be rated in terms of climate risk

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To meet the Paris Agreement, greenhouse gas emissions need to be net-zero. As absolute emissions generally cannot be zero, offsetting is required.

EMISSIONS – OFFSETS = NET ZERO EMISSIONS		
Different offset schemes vary in capacity to stop global warming. If widely used, what risks do different offset types pose to climate stability? A framework helps develop discussion of this important topic.	TYPES OF OFFSETS <ul style="list-style-type: none">Economic incentivesEmissions reductionsExtraction of carbon dioxide from atmospherePayments to external parties to support adoption of lower emissions technologies	Some offsets are economic tools to provide cost benefits for emissions reductions. Climate offsetting requirements are more demanding. The framework grades offsets from most to least benefit by helping classify offsets' climate risks.

We apply our offset climate ratings to some different types of offsets, including the sorts of schemes proposed by major oil companies, and the PAS 2060 carbon-neutrality standard.

OFFSET CLIMATE RISK-RATINGS

Emissions reduction due to superior basic or established tech.	<div>LOWER RISK</div> <div>HIGHER RISK</div>	<div>Risks of Misusing Offsetting<ul style="list-style-type: none">Offsets as last resort or first resort?Reliance on unproven technologyPriority relative to emissions reductionRobustness of carbon dioxide storageQuality of offsetting schemes adoptedEstimation of both emissions and offset volumesDisincentivises emissions reduction, encourages “business as usual”</div> <div>Offset Climate Risks<ul style="list-style-type: none">Direct physical riskTechnology riskStorage riskBiodiversity riskRisk from moral hazardQuality risk</div>
Investment in renewable energy low emission energy sources to displace fossil energy sources (wind, solar)		
Burning methane from landfill to generate CO2, or else flaring (the controlled burning of natural gas) during fossil fuel extraction.		
Payments to preserve fossil fuel reserves underground.		
Natural process that absorbs CO2 resulting in hard carbon storage.		
Afforestation: restore existing forests to maximum potential. More likely to be biodiverse robust ecosystem.		
Emissions reduction due to superior speculative tech.		
Switching fuel from oil to natural gas, coal to natural gas etc.		
Natural process that absorbs CO2 resulting in soft carbon storage		
Tech capturing CO2 at source in industrial plant with soft storage		
Tech removing CO2 directly from atmosphere with hard storage		
Crop growing and harvesting treatment resulting in soft carbon storage.		
Tech capturing CO2 at source in industrial plant with hard storage.		
Payments to preserve forest.		
Reforestation, danger of plantation, difficulty in creating biodiverse robust ecosystem.		
Tech removing CO2 directly from atmosphere with soft storage.		
Building using cement that is carbon absorbing over lifecycle.		
Arbitrary emissions quota that allows offsets to be purchased for a price. Amounts agreed by treaty of other means as being “acceptable” levels of emissions.		
Crop growing and harvesting treatment resulting in hard carbon storage.		
Fails to meet preconditions.		

Ultimately, to stabilize global warming, policymakers will need to encourage the use of high-quality offsets.

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