

## **Title: Ethical carbon offsetting in the journey to a zero-carbon world**

Authors and affiliations

\*Shilland, Robyn [r.shilland@napier.ac.uk](mailto:r.shilland@napier.ac.uk) (ORCID ID 0000-0002-2841-2440)

Edinburgh Napier University, 9 Sighthill Court, Edinburgh EH11 4BN

Tuttle, Annie [tuttle.aft@gmail.com](mailto:tuttle.aft@gmail.com)

The University of Edinburgh, Old College, South Bridge, Edinburgh EH8 9YL

Huxham, Mark [m.huxham@napier.ac.uk](mailto:m.huxham@napier.ac.uk) (ORCID ID 0000-0001-7877-6675)

Edinburgh Napier University, 9 Sighthill Court, Edinburgh EH11 4BN

### *Abstract*

There is vigorous debate in the academic literature and in civil society on the role that carbon offsetting should play in mitigating climate change, including whether offsetting is used by organisations and individuals as a 'permit to pollute'. Here, interviews with carbon market stakeholders are used to explore this ethical criticism in a 'boutique' segment of the voluntary carbon market (VCM). The results suggest that buyers are sincere in seeking holistic carbon reduction strategies and are aware that offsetting is no substitute for emissions reductions, but rather a tool in the transition to a low-carbon world. Buyers were well-informed and committed to wider sustainability, yet it is recognised that this cannot be expected throughout the market and there is an onus on sellers of carbon credits to ensure ethical practice. Ethical practice in the VCM must be strengthened to protect against risks that come with an evolving climate policy landscape.

## *Introduction*

Limiting global temperature rise to under 2°C, in line with the Paris Agreement, requires the virtual elimination of net anthropogenic carbon emissions by 2050 (Anderson, 2015). The Covid-19 crisis helps reveal the scale of this challenge. Global carbon emissions were 6.4% lower in 2020 than in 2019 (Tollefson, 2021). From 2025, reductions of around 10% per year are needed to meet the 2°C target; hence even a shock as profound as Covid-19 is unlikely to result in the necessary annual reductions.

What can individuals and businesses do to help in the essential transition to a net zero carbon world? Showing leadership by reducing their own emissions and advocating for systemic change is crucial, but until the economy is de-carbonised the conduct of daily life will still involve emissions. One response to this involves voluntary carbon offsetting, which is used by individuals and businesses to compensate, in whole or in part, for their carbon emissions. By purchasing carbon offsets, individuals or organisations can financially contribute to activities that commit to either removing CO<sub>2</sub> from the atmosphere, such as protecting or planting forests, or deliver projected emissions reductions, such as financing renewable energy initiatives, thereby compensating for emissions from activities such as driving, flying or manufacturing. The voluntary carbon market is distinct in size, character and regulation from the compliance carbon market. The latter applies to carbon-intensive industries required to partake in large scale programmes such as the EU Emissions Trading Scheme. Projects on the voluntary carbon market are typically smaller and include more nature-based solutions with a greater element of community engagement and additional co-benefits such as socio-economic development or biodiversity gains. For this reason, voluntary carbon projects are generally more expensive to implement, per tonne of carbon sequestered, than compliance

projects and demand a higher price for credits (Porras, Wells, Stephenson, and Kazis, 2016). The market traded over 42 Mt CO<sub>2eq</sub>, worth \$282 M, in 2019 (Forest Trends Ecosystem Marketplace, 2020). Although this is only around 1% of the compliance market there has been strong recent growth and there is growing impetus to massively expand the market. For example, Mark Carney, the former Bank of England governor, recently launched a taskforce aiming to rapidly enlarge the market, perhaps by as much as 150 times (Foraise, 2020).

The policy landscape in which carbon offsetting lies is changing. Article 6 of the Paris Agreement, currently under negotiation, will dictate the rules for how countries can voluntarily cooperate through market and non-market approaches to achieve their emissions reductions commitments. One proposed framework, referred to as the 'Sustainable Development Mechanism', will replace the current Clean Development Mechanism (CDM). The CDM, the largest compliance market, has been widely criticised for failing to deliver claimed emissions reductions; Cames et al (2016) report that 73% of CDM credits are unlikely to be additional to what would have been achieved in the absence of carbon financing (i.e., they fail the 'additionality' test) and that total sequestration is likely to have been overestimated. There has been neglect of community engagement and misalignment with international human rights in some CDM projects (e.g., Schade and Obergassel, 2014). Article 6 will outline the rules for new carbon markets and legislate how they will operate alongside Nationally Determined Contributions (NDCs), the commitments that each signatory makes to reach the goals of the Paris Agreement. Regardless of the outcome of these discussions, a future voluntary carbon market must deliver carbon emissions that are additional to national-level efforts and emissions facilitated by the compliance market. It must ensure projects are based on robust science and are ethical, serving social as well as environmental goals, whilst effectively complementing national and international policy frameworks on climate and related policy such as biodiversity conservation.

Carbon offsetting has been criticised on the grounds of market failure, policy inaction and ethical hazards. Critics argue that the claims by project developers of additionality, non-leakage (meaning that projects do not simply displace problems, such as forest destruction, elsewhere) and permanence (meaning that carbon savings cannot be reversed over short time periods) cannot be proven and in some cases are unfounded (e.g., Thamo and Pannell, 2015). Others argue that the implied commodification of nature is inherently wrong or ineffective (e.g., Paton and Bryant, 2012) and that scientific uncertainties mean that unsubstantiated claims of emissions reductions are made (e.g., Dhanda and Hartman, 2011). Offsetting is also accused of distracting from bolder policy decisions, allowing emissions reductions to be delayed or avoided (e.g., Markusson, McLaren, and Tyfield, 2018). Monbiot (2006) goes as far as likening offsetting to the buying of indulgences in the Medieval Catholic Church, implying that offsetting is both corrupt and actively damaging in how it assuages guilt about pollution, allowing unsustainable (mostly Western) lifestyles to perpetuate. For these critics, corporate offsetting is seen as a form of greenwashing. These criticisms are debated in published literature (e.g., Hyams and Fawcett, 2013) and are countered by practitioners of carbon trading projects (e.g., Porras et al., 2016; Huxham and Sumner 2019). As the policy landscape of carbon offsets evolves with Article 6 negotiations, these criticisms must be addressed by policymakers, carbon standards and project developers to ensure that future carbon markets are scientifically and ethically robust, ensuring real and long-term emissions reductions that are achieved through socially-just projects and interventions. There is also an onus on the carbon buyer not only to select ethically robust projects with which to offset, but also to use offsetting responsibly, as part of an integrated strategy of carbon reductions, to ensure that offsets are not used to justify perpetuating high-carbon activities and lifestyles.

Carbon offsetting, together with other carbon-reduction strategies, offers opportunities for companies to gain competitive advantage as well as to support sustainability initiatives (Tolhurst and Embaye, 2012). Good Corporate Social Responsibility (CSR) projects can

enhance reputation and employee engagement although critics argue that much CSR is predominantly cosmetic (Phillips, 2006). CSR, alongside broader ethical reasons, have been cited as primary motivations for organisations to purchase carbon offsets (Ecosystem Marketplace and Bloomberg New Energy Finance, 2011). To safeguard against the risks of superficiality or insincerity, carbon offsetting as part of a CSR strategy must be used in a way that is socially and environmentally ethical and robust.

Here we investigate arguments against offsetting, in particular that it presents a ‘moral hazard’ – the charge that offsetting allows individuals and organisations to assuage guilt without reducing their carbon emissions and that corporations use offsetting as a cheaper alternative to reductions. Using interviews with individual and corporate buyers of carbon credits, carbon credit resellers and project developers, we explore stakeholder perspectives on the role of carbon offsetting alongside wider emissions reduction strategies. We bring particular focus on the stated reasons for offsetting and the implied sincerity of choosing offsetting as one response to the climate emergency. We consider factors that influence the selection of offsetting projects, the risks and benefits of offsetting, and the roles of carbon standards and project developers in ensuring ethical practice in carbon trading. The current literature on the use of carbon offsetting by business largely focuses on the travel and aviation industries (e.g., Zeppel and Beaumont, 2012; Lu and Wang, 2018), and the conceptual debate surrounding the moral hazard of offsetting is frequently framed in the context of allowing consumers to continue to take flights rather than reducing air miles. Aviation is perhaps the main activity for which voluntary carbon credits are bought; flights are discrete events with a discernible carbon footprint, and many ‘carbon calculators’ primarily or solely estimate the emissions from flights, as opposed to other activities or lifestyle choices such as diet, manufacturing or road travel. Here, we interview stakeholders from a range of sectors and industries, including but not limited to travel, in recognition that offsetting can be and is used to compensate for emissions from many activities in addition to air travel. This study aims to identify best practice by

consumers, providers and regulators within the voluntary carbon market and to suggest how the voluntary carbon market might most usefully respond to the new challenges and opportunities raised by Article 6 of the Paris Agreement.

## *Methods*

### **Literature Review**

A review of peer-reviewed and grey literature containing criticisms of the carbon market was conducted. This included literature on the voluntary market specifically, and of carbon markets in general. Criticisms were categorised and each argument summarised. The purpose of the review was not to produce a comprehensive collection of literature but rather to read and summarise all key criticisms; as such it was conducted until saturation in the list of (often overlapping) criticisms was achieved.

### **Interviews**

Semi-structured interviews were conducted with stakeholders in the voluntary carbon market drawn from the following categories: project developers (n=3), individual carbon buyers (n=6), institutional (business, charitable organisations, universities and public sector) carbon buyers (n=5) (hereafter referred to as 'corporate buyers' with recognition of the diversity of organisations represented) and resellers of carbon credits (n=2).

### ***Participant selection***

Participants were invited by email to take part in a semi-structured interview exploring the motivations of buyers of carbon credits on the voluntary carbon market and how carbon offsetting can complement or hinder other strategies to address climate change. Carbon

buyers (individual or corporate) were selected by contacting buyers of carbon credits from the Mikoko Pamoja blue carbon project (Plan Vivo, 2020) in the last three years. The trading body for Mikoko Pamoja restricts sales of credits by scoring against ethical criteria; credits are not sold to highly-polluting organisations or buyers who do not take action to reduce their carbon footprint prior to offsetting (ACES, 2020). Project developers were selected by contacting the current certified blue carbon projects on the voluntary carbon market as well as uncertified projects that leverage donations based on a carbon benefit from the conservation of seagrass, mangrove and/or saltmarsh habitats (the so called 'blue carbon' habitats). If no response was received, invited participants were sent a follow-up email after two weeks. Of those contacted, 3/7 developers, 10/13 buyers and 2/3 resellers agreed to take part in an interview. Of the corporate buyers, 2 represented a business, 1 represented a charitable organisation, 1 represented a university and 1 represented a public body.

### ***Data collection***

Interviews (of 30-45 minutes duration) were conducted by video call and followed a semi-structured approach. A set of questions (provided in Appendix A) were developed between the three authors and were used to guide interviews, although follow-up questions were asked where appropriate to explore individual views. These questions were tailored to each stakeholder group. Interviews were recorded and fully transcribed using Otter (<https://otter.ai/>) and manual transcription. Data were anonymised following the interviews. Ethical clearance for this research was provided by the Edinburgh Napier University research ethics committee.

### ***Data analysis***

Interview transcripts were analysed using a manual thematic approach to identify emergent themes within the stakeholder groups of individual buyers, corporate buyers, resellers and

project developers of carbon offsetting. Interview transcripts were analysed independently by three members of the research team. Themes identified by the three research team members were then compared to one another to identify shared and emergent themes; a double-blind approach to analysis was applied to prevent bias and ensure confidence in the final thematic codes identified, with subsequent rounds of discussion, comparison and further refinement of themes that characterised the data as a whole (Braun and Clarke 2006). The agreed list of themes is presented below, and emergent issues discussed.

## *Results and discussion*

### **Literature review**

Criticisms of the carbon market, summarised and categorised, are shown in Table 1. Examples of references for these are provided; these are not exhaustive but give key sources. The arguments presented are categorised as being of primary relevance to the current study (shaded dark grey), meaning they are directly addressed by the research questions; of secondary relevance (shaded light grey), meaning they are discussed to a lesser degree in the context of our findings but are not comprehensively addressed; and of little to no relevance (unshaded/white), meaning that the arguments hold little to no relevance to the current study and are not addressed here.

193 Table 1. Criticisms of the carbon market published in peer-reviewed and grey literature. Arguments of primary relevance to the current research  
 194 are shaded dark grey, those of secondary relevance are shaded light grey, and those of little to no relevance are unshaded/white.

195

Category	Argument	Description	Prediction/implication	Example source(s)
Moral hazard	Individual moral licence	Individuals buy offsets to assuage guilt and this permits them to continue with high emission lifestyles and/or to ignore political action i.e., prevents individual change and activism	Individual buyers of carbon offsets are less likely than others to engage in activism for a zero-carbon economy and more likely than others to persist with high emissions lifestyles	Monbiot (2006); Jaccard (2020)
	Corporate greenwash	Corporations that buy offsets do so in the knowledge that they are cheaper and/or less effective than cutting emissions in order to avoid changing behaviour	Corporations that buy offsets will use them prominently for public image and will not commit to zero carbon plans that involve emissions reductions	Greenpeace (2020)
Neo-liberalism	Commod - ification	By turning carbon into a commodity, offsetting projects imply there are no other arguments for conserving nature or act to undermine these other arguments	Carbon trading will undermine respect for natural areas and reduce perceptions of intrinsic value	Sandel (2012) p77
	Enabling Capitalist expansion	Environmental market instruments, such as PES, help foster the growth of capitalism, which is fundamentally antithetical to sustainability	Genuine sustainability cannot be achieved within a capitalist world economy and increasing use of market instruments will accelerate environmental crisis	Büscher and Fletcher (2020)
Neo-colonialism	Expropriation	Offsetting using nature-based solutions is a form of exploitation in which rich outsiders gain financially from the	Local people will resist offsetting projects and benefits from the projects will go largely to outsiders	Bachram (2004)

		resources owned or managed by local people in developing countries		
Market failure	Fraud	Offsetting project developers, accreditors and validators all have financial (and other?) interests in corroborating offset projects and there is an asymmetrical distribution of knowledge, since buyers cannot know what developers know	Offset projects should rarely fail accreditation and validation. Independent analyses should find evidence of fraud	Jaccard (2020); Dhanda and Hartman (2011)
Known uncertainties in accreditation	Scientific uncertainties	Some offsets, particularly involving Nature Based Solutions (NbS), involve assumptions about rates of sequestration and storage that are scientifically uncertain	There will be attempts to hide uncertainty and simplify science	Popkin (2019)
	Additionality	Offset projects would have proceeded anyway, with different sources of funding	Projects that use offsets as funding are similar to a suite of other similar projects in the same countries/locations that do not. There are few examples of innovative and unusual offsetting projects.	Cames et al (2016)
	Permanence	NbS especially involving forestry, do not achieve permanent sequestration and any achievements can be reversed by future events such as fires or droughts	All types of mitigation involving NbS, whether using offsets or not, are flawed; no efforts should be expended on them if this detracts from focus on emissions	Fern (2017)
	Leakage	Offset projects simply displace emissions elsewhere	In forestry this results in higher rates of cutting outside protected/project areas than before projects. In other sectors e.g., energy total emissions in the sector do not fall	Fern (2017)

Policy making in bad faith	Carbon price deflation	Offsetting allows the carbon price to remain lower than it would otherwise in cap-and-trade policy settings hence slowing real change	Large players in compliance markets push for offsetting and markets with offsetting have lower carbon price than those without	Jaccard, quoted in Fairley (2016)
	Policy procrastination	At national and international policy levels, offsetting is used as an argument to delay and avoid emission reductions	Countries with the largest emissions and those most influenced by fossil fuel interests will push hardest for offsetting in international agreements	Markusson et al (2018); Murphy (2020)

197 **Themes identified in stakeholder interviews**

198 The main emergent themes identified are listed below, according to the stakeholder groups.

199 ***Individual buyers***

200 Buyers discussed using **offsetting as part of action for wider sustainability**. Among the  
201 individual buyers interviewed, offsetting was used in addition to (and in most cases, after)  
202 reductions or other actions to live a more sustainable lifestyle, such as driving electric vehicles,  
203 switching to electric heating systems or eating a plant-based diet:

204

205 *“I think one has got to look at it as a transitional action, one's got to become much*  
206 *more energy efficient and basically the problem is that we're continuing to add carbon*  
207 *to the atmosphere. We are reducing the amount of carbon we're putting in still, but it's*  
208 *still already too much. And that's going to be hanging around for 100 years or so. So*  
209 *we've got to look beyond going to net zero, we've got to go to negative carbon, we've*  
210 *got to draw down. So, when you put carbon offsetting into that context, it's just a pebble*  
211 *in the ocean. There's got to be huge cultural changes and technological changes, to*  
212 *really get us back to... pre industrialization levels.” [Individual buyer 2]*

213

214 Participants also discussed feelings of **guilt over previous and ongoing emissions, and**  
215 **the moral dilemma that they are unable to eliminate emissions from their lifestyle**. They  
216 discussed the need to make trade-offs between making reductions and the costs and/or  
217 feasibility of steps or actions required to reduce emissions, and of the moral dilemmas in where  
218 and when these trade-offs should be made:

219

220 *"I suppose the one word is guilt, really. When you get to my age, I'm 78, you look back*  
221 *at one's life and you see all the carbon dioxide you've produced. And you [feel] pretty*  
222 *guilty about it. We have sinned previously really, in putting all this carbon dioxide out.*  
223 *So, there is some way in which we can compensate. And then I think we have a moral*  
224 *obligation to [offset] really. But really, our contribution is so small. It's the big corporate*  
225 *organizations. They're the big, big polluters, you know. They ought to be doing far, far*  
226 *more, which is absolutely true, but, but I don't think that absolves the individual from*  
227 *doing something. Having said that we're all somewhat hypocritical really, including*  
228 *myself, because we don't do as much as we can. I mean, where do you stop?... We*  
229 *could look at all the aspects of our lives, the food we consume, the products we buy,*  
230 *and so on. And really, we should be offsetting a lot of that too... morality is on a sliding*  
231 *scale."* [Individual buyer 3]

232

233 When selecting projects from which to buy offsets, participants discussed the importance of  
234 trust in the accreditation, reputation and scientific credentials of projects and the organisations  
235 and individuals involved in developing and operating the projects. These factors reassured  
236 buyers that the projects can be trusted to fulfil environmental and social commitments and  
237 were particularly important for buyers who did not feel qualified to conduct due diligence of  
238 projects themselves:

239

240 *"[Accreditation] gives some sort of independent assurance. It goes beyond the claims*  
241 *because lots of charities or foundations could claim they're doing it."* [Individual buyer  
242 4]

243

244 *"It matters to me having some kind of third-party confirmation that what they say is*

245 *what they do, because it's a very easy thing to scam.*" [Individual buyer 6]

246

247 In addition to trust in projects, a **personal connection** with projects emerged as an important  
248 factor when purchasing offsets. Participants felt a connection to projects through previous  
249 visits to project sites, geographic connection (for example, projects located in the buyer's  
250 home country), personal interest in the ecosystem(s) within the project or other co-benefits  
251 such as community development, and professional experience:

252

253 *"I suppose it was important to [carbon offset] in a way that is beneficial to*  
254 *communities... As a professional I previously [worked in] Myanmar. And the mangrove*  
255 *swamps there [were] really significant during the huge cyclone Nargis that hit... and*  
256 *that the areas of coastline that were most protected were the mangrove ones.... My*  
257 *very superficial research tells me it's extremely efficient and absorbs a lot of carbon,*  
258 *much more efficient, and I think the alternatives... And it is exceptionally important to*  
259 *coastline communities and to protecting inland communities from the coastline."*

260 [Individual buyer 4]

261

## 262 **Corporate buyers**

263 Corporate buyers of carbon credits who participated in the research conducted **due diligence**  
264 **of projects** that they bought carbon offsets from and the standards by which they are  
265 accredited. In some cases, participants felt a particular need to conduct this due diligence due  
266 to an awareness of public criticisms of offsetting as a sustainability tool and of the credibility  
267 (or lack thereof) of projects discussed in public literature:

268

269 *“We looked at projects that were accredited with [carbon standard] for emissions*  
270 *reduction projects, and then the [carbon standard] for sequestration projects... And*  
271 *then we put that to a survey to staff because we want staff to weigh in on this and we*  
272 *want to buy offsets, that means something to our business. So, we've provided an*  
273 *option, we've done a one-page write up on each project, we've thoroughly reviewed all*  
274 *the documentation. And we've used Google satellite images to show where these*  
275 *projects are, here are the windmills and so on. So, people really know [that] these are*  
276 *real projects, here's where they are, here's how many people or communities they're*  
277 *supporting.” [Corporate buyer 3]*

278

279 Participants discussed **the value of accreditation** in the due diligence process; this was  
280 important not only for peace of mind but for corporate reasons including the ability to claim  
281 credible carbon reductions:

282

283 *“[Lack of certification] would definitely put me off. Because there are so many projects*  
284 *around the world... if we don't know for sure that it is well carried out, well followed up*  
285 *and preferably long term, then yeah, it's like throwing the money out of the window not*  
286 *knowing who is going to pick it. So, it's also about justification. If people ask you what*  
287 *why did you choose that project? I can say, well, it's certified [and] there is a body that*  
288 *is going to check whether everything that is done is according to the rules.” [Corporate*  
289 *buyer 3]*

290

291 Participants also discussed their **ambitions in offsetting and for wider sustainability**. Some  
292 participants discussed going beyond the minimum when buying offsets, including offsetting  
293 more CO<sub>2</sub> than they emit and paying more for high-quality projects:

294

295 *“This was about practicing what we preach and ensuring that we do the best that we*  
296 *can... this isn’t something that we have to do, so maybe going a bit further and of*  
297 *course this isn’t waving the magic wand and the emissions disappear the moment you*  
298 *offset them. It certainly doesn’t let us off the hook, so we do see this as acknowledging*  
299 *our emissions rather than magically making them disappear. And we do our carbon*  
300 *footprint to see how we’re performing; we get this number at the end which we offset*  
301 *but that’s not the main purpose of this exercise. We consider it as the last resort when*  
302 *we can’t effectively reduce our emissions.” [Corporate buyer 5]*

303

304 Seeking an **alignment with the vision and values of the company** was reported by most  
305 participants to influence their choice of offsetting project. For example, businesses that had a  
306 connection to the ocean discussed favouring ‘blue carbon’ credits, while businesses with a  
307 strong community focus identified community development co-benefits as a key project  
308 characteristic that they looked for in offsets:

309

310 *“One of our main pillars in sustainability is [to] work together with local communities in*  
311 *everything we do [which is] why we decided to work together with [project] because we*  
312 *want to collaborate with partners that are in the same country as most of our trips are*  
313 *organised... we want to have local partners... and ideally community-run community*  
314 *based because it affects both of our pillars [of] sustainable community development*  
315 *and compensating our carbon.” [Corporate buyer 2]*

### 316 **Resellers**

317 Resellers of carbon credits discussed their clients using **carbon offsets as a secondary**  
318 **component of sustainability**. When developing clients’ sustainability strategies, carbon

319 offsets are applied late in the process to address emissions that cannot be reduced. Resellers  
320 explained that clients are not encouraged to, and often do not want to, offset and instead  
321 favour reductions or ‘insetting’ (financing activities or interventions within their own processes  
322 that deliver carbon reductions):

323

324 *“I think of [offsetting] as one component. I think that reductions just need to be at the*  
325 *heart of everything that we do. That’s obviously much more difficult, but I think that we*  
326 *have to cut our reliance on fossil fuels, and we have to reduce our impact and then the*  
327 *offsetting component is that last push to bring about neutrality if you can. But I think*  
328 *it’s really, really important but it’s only one component and to me, probably a smaller*  
329 *component next to actually reducing our emissions.” [Reseller 2]*

330

331 The themes of **due diligence in projects, the value of accreditation, ambition in offsetting**  
332 **and wider sustainability**, and **alignment with the vision and values of the company**, all  
333 discussed by corporate buyers, were also identified as themes within reseller interviews. This  
334 was the case for both the reseller’s own opinions and the opinions that they observe among  
335 clients; for example, resellers valued credible certification and reported that this was often a  
336 factor in clients’ decisions-making when selecting a project from which to purchase offsets.

### 337 ***Project developers***

338 Project developers who participated in the research were mostly (and in the case of  
339 developers of certified projects, all) **discerning of offset buyers**. The project developers who  
340 applied criteria to who can purchase their carbon offsets discussed refusing sales of offsets to  
341 clients who do not first reduce their carbon footprint, and/or to high-polluting industries such  
342 as oil and gas:

343

344 *“We really try and find organizations or brokers that share our values... that we really*  
345 *believe in, and we kind of like hold very close to our hearts, so trying to find*  
346 *organizations that align with those values... We have sold to brokers, but I think going*  
347 *forward, we're going to try and find organizations to sell to ourselves, so we've just got*  
348 *a better idea of where those credits are actually ending up because we're trying to only*  
349 *sell to companies which are using that these offsets... to offset their unavoidable*  
350 *emissions... that have other strategies to bring down their company's emissions more*  
351 *generally, and then for this set of unavoidable emissions they're using offset.” [Project*  
352 *developer 2]*

353

354 Project developers also discussed the **uncertainty of the future of the voluntary carbon**  
355 **market**. Project developers described the effects of current and projected instability in the  
356 carbon market caused by changes in politics, finance and public perceptions:

357

358 *“I think the uncertainties... regarding how voluntary offset projects fit into a country's*  
359 *and NDCs and national accounting, there's a lot of uncertainty around that... The CDM*  
360 *never lived up to the expectations and everything like that, you know, and I do think*  
361 *there is a potential for a real global compliance market in the future which may or may*  
362 *not make the voluntary market redundant. But in the interim, there's... a real*  
363 *opportunity for voluntary offsets. But the uncertainty is what's killing it. If we wanted to*  
364 *do a [large] project that would be a big investment and a big commitment and for those*  
365 *bigger projects you really need investors to help you do it, you need that investment*  
366 *commitment in order to be able to go ahead and one thing that investors hate is*  
367 *uncertainty and the slow speed at which the Paris Agreement is moving forward and*  
368 *materializing, and now with COVID over everything.” [Project developer 2]*

369

370 Project developers also discussed **alternatives to carbon** as a source for funding  
371 conservation. Project developers are aware of the value of ecosystem services other than  
372 carbon (such as coastal protection and fisheries enhancement) and hope to explore or are  
373 exploring how these can be incorporated into project design and funding. Participants  
374 discussed how the current major focus on carbon in Payments for Ecosystem Services (PES)  
375 markets is not beneficial and can be a risk to projects:

376

377 *“This kind of myopic focus on carbon, if you will, I think it's detrimental to an extent on*  
378 *the larger conversation and then financing. [Blue carbon ecosystems] wave*  
379 *attenuation property properties... from an actual measurable perspective, you know,*  
380 *how much are these systems actually protecting us and can we assign a value to that?*  
381 *Yeah. And I think from a PES perspective [it's best] to move beyond carbon. I really*  
382 *would like to see us move more in the direction of the resilience credits that are being*  
383 *developed right now... really trying to think about what are some of the other benefits,*  
384 *and can we add additional value.” [Project developer 1]*

### 385 **Carbon standards**

386 Carbon standard representatives discussed the **transitional role of carbon** in funding nature-  
387 based solutions to climate change. They suggested that carbon trading may not, or even  
388 should not, exist in the medium to distant future; however, for now, it serves a purpose:

389

390 *“I see [carbon offsetting] as a shorter-term solution – something that in 10 or 15 years*  
391 *I hope we don't have carbon offsetting because I hope we've moved on past that. Right*  
392 *now, it's something that can help get financing to projects on the ground, at this*  
393 *moment, that need financing to make a climate impact. So that's how we see it at this*  
394 *stage, it's obviously not the full answer to addressing climate change because*

395 *ultimately it is allowing people to offset emissions rather than fully reduce their*  
396 *emissions, but it is helping to finance activities that otherwise wouldn't be able to occur*  
397 *and need to occur now because of the trajectory that we're on toward global warming."*

398 [Carbon standard 1]

399

400 Although carbon offsetting was seen as a transitional mechanism, participants from carbon  
401 standards discussed the **challenges of diverging from carbon** under PES frameworks.  
402 Although pathways exist for accreditation against non-carbon ecosystem services, these are  
403 rarely used by projects due to technical and market challenges:

404

405 *"The main reason we have this focus on carbon crediting is it's the easiest way to*  
406 *accredit a project right now, there's an existing carbon market, it's a very quantifiable*  
407 *unit of [carbon dioxide] that is fundable across different project types and areas, so it's*  
408 *just easier to do a carbon project and have this carbon credit and then there are these*  
409 *other benefits that are equally important, or in cases more important, but they're just*  
410 *automatically associated with this very quantifiable unit."* [Carbon standard 1]

411

412 *"I think that [lack of methodologies for ecosystem service beyond carbon] puts people*  
413 *off a lot. If you had methodologies in place for water quality or whatnot, I imagine you're*  
414 *going to be more likely to get projects to come in because it's less of a hurdle to make*  
415 *that happen.... I think [the market] is just incredibly carbon centric right now."* [Carbon  
416 standard 1]

417

418 Participants from carbon standards also discussed the **policy sensitivity of carbon trading**,  
419 demonstrating an awareness of the current policy context and horizons and the (potential)  
420 implications of new developments for the voluntary carbon market:

421

422 *“Another big challenge that we’ve identified is that there is a lot of uncertainty around*  
423 *how blue carbon activities will be included in NDCs or national accounting, and that’s*  
424 *making it difficult for projects to be developed now. Broadly for forestry projects, they’re*  
425 *going to be required to align with national accounting of projected deforestation rates,*  
426 *and the idea is that certain types of wetlands may be included in that in certain cases,*  
427 *but it’s unclear when wetlands will be included or when mangroves are included,*  
428 *because they are considered forests. But other types of blue carbon ecosystems like*  
429 *seagrass aren’t included there [there’s] this uncertainty over whether blue carbon*  
430 *activities will be within or outside of national accounting, and that has impacts on*  
431 *whether there is a potential for double-counting between the voluntary project and*  
432 *national accounting. So, because of the uncertainty, it’s making it difficult for projects*  
433 *to be developed right now.” [Carbon standard 2]*

#### 434 **Synthesis, analysis and implications of themes**

435 Here we outline the key messages revealed by our themes and consider some of their  
436 implications for arguments around offsetting in the voluntary market.

#### 437 ***Sincerity of buyers***

438 The ‘moral hazard’ argument against offsets is summarised by Sandel (2012, p77) as the  
439 danger ‘that those who buy them will consider themselves absolved of any further  
440 responsibility for climate change...carbon offsets will become... a painless mechanism to buy  
441 our way out of the more fundamental changes... required’. There was no support for that  
442 argument here; individual and corporate buyers of carbon credits described a wide range of

443 actions they were taking to achieve holistic carbon reductions. Sandel's use of 'absolved'  
444 implies that guilt is one motivation for offsetting and that was certainly reflected in comments  
445 from our interviewees:

446

447 *"I could choose not to [fly to visit family] but that would have quite a big impact on my*  
448 *relationships with people. So, I choose to make that indulgence of flying around the*  
449 *world. But I want to be able to offset that. Otherwise, I'm deeply hypocritical."* [Individual  
450 buyer 1]

451

452 Whilst guilt at emissions was a motivation, buying offsets was not 'painless' for our  
453 interviewees, neither by removing the need for other material changes nor by removing the  
454 difficult emotions experienced when grappling with this issue. Whilst critics often allege  
455 hypocrisy against those who purchase offsets, the quote above illustrates how most of our  
456 respondents would see ignoring offsetting as a greater hypocrisy, and how people and  
457 organisations are wrestling with genuine ethical trade-offs felt by climate-conscious individuals  
458 trying to do their best in a globalised world. Context is key here; the interviewee in question  
459 referred to an annual international flight taken to their home country, arguably an essential trip  
460 without which relationships - and the health, happiness and quality of life implications that  
461 come with them - would suffer. The 'permit to pollute' argument is frequently framed in the  
462 context of superfluous flights taken by frequent fliers. This example of an 'ethical trade-off', in  
463 which serious consideration is given to the balance between the positive and negative impact  
464 of emissions-generating choices, was also voiced by other interviewees, several of whom  
465 expressed appreciation that offsetting was an option to mitigate the emissions of a flight, or  
466 other activity, that was deemed genuinely necessary to the individual or organisation involved.

467

468 A sincere commitment to sustainability was also expressed by corporate buyers of carbon

469 credits. Corporate buyers discussed a range of commitments that showed sincere  
470 engagement with sustainability. These included reducing operational carbon emissions, more  
471 sustainable work practices such as plastics reduction and buying a greater number of offsets  
472 than were needed to compensate for their own emissions. A willingness to pay a higher price  
473 for high quality offsets was also expressed by several individual and corporate buyers. One  
474 corporate buyer said:

475

476 *“We're buying twice as many offsets as we need and also... we're not picking offsets*  
477 *based on price, all of... the offset projects we identified are well above the average*  
478 *price.” [Corporate buyer 3]*

479

480 These statements of commitment towards sustainability should be scrutinised; ‘greenwashing’  
481 is always possible. However, interviewees gave evidence of a range of commitments that  
482 suggest sincerity. In many cases, action was taken by buyers to conduct due diligence of  
483 projects (see ‘**Buyers need guidance**’ below) to assess the project’s merits and fit with the  
484 organisation’s or individual’s values and principles. For example, one corporate buyer  
485 discussed that their organisation did not see sequestration (as opposed to emissions  
486 avoidance) offsetting projects as appropriate to utilise to offset ongoing emissions; these  
487 projects, the organisation believed, should be implemented regardless of ongoing emissions  
488 mitigation programmes to compensate for ‘legacy’ carbon already released. This organisation  
489 therefore doubled its offsets purchased; half in emissions-avoidance offsetting projects (to  
490 compensate for ongoing emissions) and half in sequestration (to fund environmental  
491 restoration and partially compensate for legacy carbon).

492

493 Buyers also emphasised the importance of trust in and personal connections with projects and  
494 project developers when choosing offsets, suggesting a genuine commitment to supporting

495 high-quality projects rather than a 'quick fix' of a cheap offset. Most participants felt that despite  
496 the actions they were already taking towards sustainability, more could and should be done  
497 by themselves and wider society if the climate crisis is to be addressed; offsetting was not  
498 viewed by these participants as an excuse to delay further action, but rather one component  
499 of a transition towards a low-carbon world. Hence our findings support the results of previous  
500 research focused on larger corporations that found businesses that invest in offsets are those  
501 most likely to engage in serious carbon reductions in their own operations (Tucker, 2019).  
502 Rather than acting as a signifier of greenwash, this work and our own suggests that buying  
503 offsets is a marker of sincerity.

504

505 A preference for projects that aligned with the buyer's personal and professional experiences  
506 and values emerged as a theme among individual and corporate buyers; this was expressed  
507 alongside a view of carbon offsetting having a dual purpose of emissions mitigation and  
508 supporting worthwhile causes such as biodiversity conservation and socio-economic  
509 development. In some cases, this 'additional benefit' was a more influential factor in the  
510 purchase of credits than the offset value itself; one corporate buyer, who had expressed a  
511 discomfort with offsetting but used it as part of a transitional model towards zero carbon  
512 emissions, said:

513

514 *"It's not really about net zero for us... it's about supporting good projects."* [Corporate  
515 buyer 3]

516

517 Others expressed guilt over 'legacy' emissions - over the individual or organisation's lifespan  
518 or beyond - and felt an obligation to sequester these emissions and support those most  
519 affected by climate change. One individual buyer said:

520

521           *“We all have been part of the problem and are implicated, whether we like it or not,*  
522           *and all the NGOs and government agencies, environment agencies to have made and*  
523           *continue to make, with the best will in the world, mistakes, and get it wrong and see*  
524           *and with hindsight can see how it would have been better done things differently. It's*  
525           *not easy... there's no time [and] we have to learn so fast and really get things right this*  
526           *time.”* [Individual buyer 2]

527

528 Hence our findings do not support the predictions of the ‘moral hazard’ argument, either in its  
529 individual or corporate versions. Participants did not feel ‘absolved’ or seek cheap fixes.  
530 Rather they wrestled will trade-offs, sought out projects they felt they could trust (which were  
531 often more expensive), chose to buy more credits than needed and to consider legacy carbon  
532 and discussed a wide range of other actions in addition to offsetting.

533

#### 534 ***Businesses need guidance***

535 Individual and corporate buyers within the study were generally well-informed about projects  
536 and conducted due diligence; in some cases, the certification was taken as a sufficient sign of  
537 quality assurance, although other buyers went above and beyond this to appraise projects  
538 themselves. Buyers (both corporate and individual) and resellers of carbon credits expressed  
539 a demand for high-quality offsets that deliver co-benefits beyond carbon. Several participants  
540 stated that price was no factor, or a lesser factor, in selecting a project and that a high-quality  
541 and trustworthy project was of far greater importance. One corporate buyer said:

542

543           *“We're not picking offsets based on price... all of the offset projects we identified are*  
544           *well above the average price. We're not interested in buying cheap offsets. And*

545 *actually, I'd be happy to buy the more expensive credible offsets because it's just too*  
546 *cheap. It needs to be more expensive. We're tentatively having talks about whether or*  
547 *not we need like a minimum offset price in the public sector to bolster some of these*  
548 *quality projects that are more expensive.” [Corporate buyer 2]*

549

550 This preference for high-quality offsets was in cases accompanied by expressions of difficulty  
551 in assessing projects' credentials. Some participants used carbon standard accreditation as  
552 an indicator of quality, although many conducted due diligence at a project level in addition to  
553 this and expressed an inclination to learn more about, and assess, the projects themselves.  
554 This additional due diligence not only adds confidence to quality assurance, but may serve to  
555 enhance buyer engagement in environmental practices beyond offsetting, as expressed by  
556 participants including an individual buyer:

557

558 *“Being interested in offsetting has opened up lots of new connections and networks for*  
559 *me in terms of local environmental initiatives.” [Individual buyer 1]*

560

561 The results suggest a desire among voluntary carbon buyers to engage with the projects that  
562 they support, beyond simply claiming the carbon offset. There is therefore an onus on project  
563 developers and carbon standards to make project information accessible to buyers to facilitate  
564 this engagement. This could increase consumer knowledge of the offsetting process and  
565 market and encourage more mainstream engagement with carbon markets by the general  
566 public and businesses. Third-party, independent guidance on the assessment of projects and  
567 standards may benefit consumer due diligence of projects and carbon standards. One  
568 individual buyer expressed trust in the endorsement of well-known and respected institutions;  
569 third-sector organisations independent from the carbon market may therefore play a role in

570 supporting due diligence conducted by individuals, businesses and other organisations. An  
571 individual buyer said:

572

573 *“A lot of my charitable giving, I do through the [tax-free government scheme] ... and*  
574 *because a lot of these carbon offsetting schemes, because they’re out of the country,*  
575 *they aren’t on those schemes. But I understand why they’re not. So, it is a little bit of a*  
576 *quandary. I would be more likely, if somebody like WWF, a big legitimate organisation,*  
577 *put their stamp on it, I would probably be more prepared to support it.” [Individual buyer*  
578 *6]*

579

580 There may therefore be an opportunity for third-sector organisations, independent of carbon  
581 market actors, to provide guidance and due diligence on carbon offsetting projects; a recent  
582 example is the ‘Oxford Principles for Net Zero Aligned Carbon Offsetting’ (Allen et al, 2020).

583 The voluntary carbon market has been criticised in the past for its lack of central (national or  
584 international) regulation in comparison to the compliance market (Dhanda and Hartman,  
585 2011). However, the numerous examples of strongly-criticised Clean Development  
586 Mechanism projects suggests that central regulation is not a guarantee of quality assurance  
587 in the voluntary carbon market; indeed, one of the strengths of the market is the range of  
588 projects it can support, with different sectors, locations and forms of governance. The absence  
589 of a single regulatory authority in the VCM does not mean there is no regulatory scrutiny.  
590 Projects accredited by one of the VCM standards (such as Plan Vivo or the Verified Carbon  
591 Standard) must undergo rigorous inspection and auditing, during establishment and running.  
592 Projects also need to report to the charity regulator (for those bodies operating as charities),  
593 to governmental stakeholders and undergo public scrutiny from civil society and academia;  
594 this scrutiny and governance is not always recognised or acknowledged in criticisms of  
595 offsetting. Dhanda and Hartman (2011) refer to a lack of technical literacy on the part of carbon

596 offset buyers which makes it difficult for them to assess projects. There is therefore an  
597 opportunity and also a need for guidance on ethical practice in using offsets as part of wider  
598 carbon reduction strategies.

599 ***Onus on sellers to ensure ethical practices***

600 Carbon offsetting is complex and poorly understood. Carbon projects and standards have a  
601 collective interest in helping buyers navigate the market and understand what offsetting can  
602 and cannot achieve for sustainability. This should include helping to educate and guide buyers  
603 towards sustainability and exercising discretion in making sales; cynical greenwashing by  
604 buyers would threaten systemic reputational damage for all stakeholders in the VCM. For  
605 example, the Environmental Defense Fund (2020) organised a stakeholder consultation that  
606 included a range of project developers and project standards and produced recommendations  
607 on how the sector can work collectively to ensure ethical practices, increased ambition and  
608 synergy with international policy.

609

610 Much of the discussion on the ethics of offsetting focuses on consumer behaviour (i.e.,  
611 whether or not consumers of carbon credits use offsets alongside emissions reductions) and  
612 the implication of this for the future of the carbon market. Less has considered the role that  
613 sellers of carbon credits, and carbon standards, can play in ensuring ethical practice. Two of  
614 the three project developers (both accredited to carbon standards) interviewed here stated  
615 that they apply eligibility criteria to buyers when accepting sales, avoiding or restricting sales  
616 to organisations with high emissions and no demonstration of carbon reductions prior to using  
617 offsets. Many resellers of credits act in a similar way, working to assess, reduce and mitigate  
618 organisations' emissions as well as providing offsets. One 'carbon standard' participant also  
619 saw a role for standards in ensuring that the sale of offsets influences the behaviour of buyers  
620 to reduce their emissions.

621 *Arguments beyond moral hazard*

622 Of the criticisms listed in table 1, moral hazard (in both individual and corporate forms) is the  
623 most relevant to the current work and we refute it for the sample considered here. Other  
624 arguments are less relevant or harder to assess. The dangers of fraudulent trading (market  
625 failure) and difficulties arising from scientific uncertainties around the scale and permanence  
626 of carbon sequestration are acknowledged in the emphasis given by buyers on the need for  
627 trust and credibility, which is closely associated with third party accreditation. The concern  
628 about neo-colonialism, or the expropriation of resources used by people in the global south by  
629 powerful outsiders, is largely irrelevant for smaller scale voluntary market projects, which must  
630 work with the owners and users of the resources and show local benefit in order to achieve  
631 accreditation. Critiques of commodification of nature apply beyond carbon offsetting; they raise  
632 fundamental issues of values and politics mostly beyond the scope of this paper. However,  
633 we note how all our interviewees emphasised the co-benefits – to people and nature - of the  
634 offsetting projects they supported and there was no evidence here that a multidimensional  
635 conception of values had been flattened into a single metric of price. Instead, people can  
636 balance and maintain values that are different and sometimes incommensurable. The final set  
637 of arguments labelled ‘policy making in bad faith’ in Table 1, are vitally important at an  
638 international scale. They apply mostly to the compliance market or to very large-scale  
639 corporate offsetting, although the voluntary market may help set norms and expectations that  
640 influence broader policy (and is certainly in turn influenced by this wider context). The project  
641 developers, standards and resellers (along with some larger corporate buyers) interviewed  
642 here understood the importance of this broader context, although have limited influence on it.  
643 A crucial opportunity to help shape this will come in the negotiations over article 6 of the Paris  
644 agreement, which need to ensure large scale, compliance offsetting is not used to undermine  
645 emissions reductions policies.

646 **Article 6: policy context for offsetting**

647 New market mechanisms under Article 6 of the Paris Agreement, currently under negotiation,  
648 will supersede the carbon trading mechanisms of the Kyoto Protocol. Although the voluntary  
649 market operates independently of the compliance markets established and regulated under  
650 Kyoto the outcome of these negotiations is likely to impact the way that the voluntary carbon  
651 market will be able to operate.

652 The Clean Development Mechanism (established under Kyoto) has been plagued by  
653 accusations of ineffectiveness (e.g., Cames et al, 2016) and malpractice (e.g., Schade and  
654 Obergassel, 2014), particularly in relation to human rights. It is widely recognised that Article  
655 6 must improve upon the CDM; however, the details of how this will be done are proving  
656 controversial. With nations such as Brazil and Australia campaigning for projects and credits  
657 to be carried over from the CDM, there is a risk of weakening new mechanisms and repeating  
658 past mistakes.

659 While the voluntary market is not governed by Article 6, it is implicitly linked to the compliance  
660 market as Article 6 mechanisms will set out how governments can claim and trade carbon  
661 alongside (and potentially within) the scope of their Nationally Determined Contributions  
662 (NDCs) - the national-level commitments to reaching their emissions reductions to limit global  
663 warming to 2 degrees or less. It is not clear how or if credits traded on the VCM will be linked  
664 to NDCs and what mechanisms will be in place to avoid 'double counting' in which  
665 internationally traded credits are 'claimed' by more than one party. Whilst expansion of the  
666 carbon market under Article 6 may bring opportunities for the voluntary market, it might also  
667 threaten the removal of autonomy and local control and the loss of flexibility and innovation.  
668 Even without formal links between them, developments in the compliance market will affect  
669 the voluntary market since distinctions between them are not widely understood by the public.  
670 The most cogent criticisms of carbon offsetting, such as policy making in bad faith (Table 1),  
671 apply solely or predominately to the compliance market, yet failings here threaten to taint  
672 voluntary market activities by association.

673 This reputational risk is already evident under the CDM; it could become worse if Article 6  
674 does not enact sufficient improvements to the compliance market. It is therefore imperative  
675 that robust protocols and safeguards are embedded into Article 6; if these do not materialise,  
676 the voluntary carbon market must act to distinguish itself to avoid further reputational damage.  
677 The results presented here present guidance to carbon project developers and standards in  
678 ensuring ethical practice in carbon trading and give an insight into the decision-making taken  
679 by carbon credit buyers in a ‘boutique’ segment of the voluntary carbon market defined by a  
680 strong emphasis on co-benefits, higher than average offset prices and existing “ethical buyer”  
681 criteria.

## 682 *Conclusion*

683 The ‘moral hazard’ criticism of offsetting is best seen as an hypothesis about how people might  
684 behave. Here, we find no evidence in support of it; rather the choice to offset is a sign of  
685 personal and corporate engagement with the challenges of sustainability. These findings may  
686 not represent the whole carbon market. We recognised that the study participants represented  
687 a niche market segment of small-scale, high-quality projects (and buyers of credits from these  
688 projects). However, the findings do highlight that offsetting practices by organisations and  
689 individuals may be more diverse than public discourse regarding offsetting might suggest. The  
690 carbon market is novel and complex. Project developers, carbon sellers and carbon standards  
691 therefore have a responsibility to guide buyers not only in transparent communication of  
692 projects and offsets, but also in the role of offsets in the transition to a low-carbon world.  
693 International climate policy is progressing, but corresponding governmental action still lacks  
694 the ambition and headway needed to limit global temperature rise to 2°C, as set out in the  
695 Paris Agreement. Voluntary carbon offsetting must support this broader goal. When it does it  
696 presents opportunities for the private sector and individuals to be part of this transition to zero  
697 carbon, and to strengthen global action above and beyond governmental action.

698

## References

- 700 ACES (2020). The 3 Ps of carbon offsetting. Available at: <https://www.aces-org.co.uk/the-3->  
701 [ps-of-carbon-offsetting/](https://www.aces-org.co.uk/the-3-ps-of-carbon-offsetting/) [Accessed 10/11/2020]
- 702 Allen, M., Axelsson, K., Caldecott, B., Hale, T., Hepburn, C., Hickey, C., Mitchell-Larson, E.,  
703 Malhi, Y., Otto, F., Seddon, N. and Smith, S. (2020). The Oxford principles for net zero  
704 aligned carbon offsetting. Available at:  
705 [https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-](https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf)  
706 [2020.pdf](https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf) [accessed 20th January 2021]
- 707 Anderson, K. (2015). The hidden agenda: how veiled techno-utopias shore up the Paris  
708 Agreement. Available at: [http://kevinanderson.info/blog/wp-](http://kevinanderson.info/blog/wp-content/uploads/2016/01/ParisSummary-2015.pdf)  
709 [content/uploads/2016/01/ParisSummary-2015.pdf](http://kevinanderson.info/blog/wp-content/uploads/2016/01/ParisSummary-2015.pdf) [Accessed 22 October 2020]
- 710 Bachram, H. (2004). Climate fraud and carbon colonialism: the new trade in greenhouse  
711 gases. *Capitalism Nature Socialism*, 15(4), 5-20.
- 712 Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research*  
713 *in Psychology* 3 (2): 77–10. doi: 10.1191/1478088706qp063oa
- 714 Büscher, B. and Fletcher, R. (2020). *The conservation revolution. Radical ideas for saving*  
715 *nature beyond the anthropocene.* Verso, London. doi:  
716 10.1080/14888386.2020.1811769
- 717 Cames, M., Harthan, R., Füssler, J., Lazarus, M., Lee, C.M., Erickson, P. and Spalding-Feche,  
718 R. (2016). How additional is the Clean Development Mechanism? Öko-Institut, Berlin,  
719 Germany

720 Dhanda, K. and Hartman, L. (2011). The ethics of carbon neutrality: a critical examination of  
721 voluntary carbon offset providers. *Journal of Business Ethics* 100(1): 119-149. Doi:  
722 10.1007/s10551-011-0766-4

723 Ecosystem Marketplace and Bloomberg New Energy Finance (2011). Back to the future: state  
724 of the Voluntary Carbon Markets. Ecosystem Marketplace and Bloomberg New Energy  
725 Finance, New York and Washington, DC

726 Environmental Defense Fund (2020). Mobilizing Voluntary Carbon Markets to drive climate  
727 action: recommendations. Environmental Defense Fund, New York

728 Fairley, P. (2016). If carbon pricing is so great, why isn't it working? Ensia. Available at:  
729 <https://ensia.com/features/carbon-pricing-why-isnt-it-working/> [Accessed 03/12/2020]

730 Fern (2017). Unearned credit. Why aviation industry forest offsets are doomed to fail. Available  
731 at: [https://www.fern.org/fileadmin/uploads/fern/Documents/Unearned%20Credit\\_0.pdf](https://www.fern.org/fileadmin/uploads/fern/Documents/Unearned%20Credit_0.pdf)  
732 [Accessed 03/12/2020]

733 Foraise, D. (2020). BOE's Carney launches global taskforce to boost voluntary carbon.  
734 Ecosystem Marketplace, 2 September. Available at  
735 [https://www.ecosystemmarketplace.com/articles/boes-carney-to-head-global-task-on-](https://www.ecosystemmarketplace.com/articles/boes-carney-to-head-global-task-on-voluntarycarbon/)  
736 [voluntarycarbon/](https://www.ecosystemmarketplace.com/articles/boes-carney-to-head-global-task-on-voluntarycarbon/) [accessed 1/06/2021]

737 Forest Trends Ecosystem Marketplace (2020). Voluntary carbon and the post-pandemic  
738 recovery. State of Voluntary Carbon Markets report, special climate week NYC 2020  
739 instalment. Forest Trends Association, Washington DC

740 Greenpeace (2020). The biggest problem with carbon offsetting is that it doesn't really work.  
741 Available from: [https://www.greenpeace.org.uk/news/the-biggest-problem-with-carbon-](https://www.greenpeace.org.uk/news/the-biggest-problem-with-carbon-offsetting-is-that-it-doesnt-really-work/?source=GA&subsource=GOFRNOAGA034J&gclid=Cj0KCQiAtqL-)  
742 [offsetting-is-that-it-doesnt-really-](https://www.greenpeace.org.uk/news/the-biggest-problem-with-carbon-offsetting-is-that-it-doesnt-really-work/?source=GA&subsource=GOFRNOAGA034J&gclid=Cj0KCQiAtqL-)  
743 [work/?source=GA&subsource=GOFRNOAGA034J&gclid=Cj0KCQiAtqL-](https://www.greenpeace.org.uk/news/the-biggest-problem-with-carbon-offsetting-is-that-it-doesnt-really-work/?source=GA&subsource=GOFRNOAGA034J&gclid=Cj0KCQiAtqL-)

744 BRC0ARIsAF4K3WEUCLEyGnOhTaTIGLOz1RAFDDVxXEteC-  
745 k7WRmv0IIQ5F4pIEckkiQaArY5EALw\_wcB [Accessed 03/12/020]

746 Huxham, M. and Sumner, D. (2019). The sins of the fathers – offsets and legacy carbon.  
747 Available at: [https://www.aces-org.co.uk/the-sins-of-the-fathers-offsets-and-legacy-](https://www.aces-org.co.uk/the-sins-of-the-fathers-offsets-and-legacy-carbon/)  
748 [carbon/](https://www.aces-org.co.uk/the-sins-of-the-fathers-offsets-and-legacy-carbon/) [Accessed 13/11/2020]

749 Hyams, H. and Fawcett, T. (2013). The ethics of carbon offsetting. *WIREs Climate Change*  
750 4(2): 91-98. doi: 10.1002/wcc.207

751 Jaccard, M. (2020). *The citizen's guide to climate success: overcoming myths that hinder*  
752 *progress*. Cambridge University Press, Cambridge, UK. doi:  
753 10.1080/09644016.2020.1757587

754 Lu, J. and Wang, C. (2018). Investigating the impacts of air travellers' environmental  
755 knowledge on attitudes toward carbon offsetting and willingness to mitigate the  
756 environmental impacts of aviation. *Transportation Research Part D: Transport and*  
757 *Environment* 59: 96-107. doi: 10.1016/j.trd.2017.12.024

758 Lui, Z., Ciais, P., Deng, Z., Lei, R., Davis, S.J., Feng, S., Zheng, B., Cui, D., Dou, X., Zhu, B.,  
759 Guo, R., Ke, P., Sun, T., Lu, C., He, P., Wang, Y., Yue, X., Wang, Y., Lei, Y., Zhou, H.,  
760 Cai, Z., Wu, Y., Guo, R., Han, T., Xue, J., Boucher, O., Boucher, E., Chevallier, F.,  
761 Tanaka, K., Wei, Y., Zhong, H., Kang, C., Zhang, N., Chen, B., Xi, F., Liu, M., Bréon, F-  
762 M., Lu, Y., Zhang, Q., Guan, D., Gong, P., Kammen, D.M., He, K. and Schellnhuber,  
763 H.J. (2020). Near-real-time monitoring of global CO<sub>2</sub> emissions reveals the effects of  
764 the COVID-19 pandemic. *Nature Communications* 11: 5172. doi: 10.1038/s41467-020-  
765 18922-7

766 Markusson, N., McLaren, D. and Tyfield, D. (2018). Towards a cultural political economy of  
767 mitigation deterrence by negative emissions technologies (NETs). *Global Sustainability*  
768 1(10): 1-9. doi: [10.1017/sus.2018.10](https://doi.org/10.1017/sus.2018.10)

769 Monbiot (2006). Selling indulgences. Available at:  
770 <https://www.monbiot.com/2006/10/19/selling-indulgences/> [accessed 14/07/2020]

771 Murphy (2020). Airline offsetting is a distraction from policies that can actually reduce  
772 emissions. Transport and Environment. Available at:  
773 [https://www.transportenvironment.org/newsroom/blog/airline-offsetting-distraction-](https://www.transportenvironment.org/newsroom/blog/airline-offsetting-distraction-policies-can-actually-reduce-emissions)  
774 [policies-can-actually-reduce-emissions](https://www.transportenvironment.org/newsroom/blog/airline-offsetting-distraction-policies-can-actually-reduce-emissions) [Accessed 01/12/2020]

775 Paton, J. and Bryant, G. (2012). Valuing pollution: problems of price in the commodification of  
776 nature. *The Economic and Labour Relations Review* 23(1): 87-106. Doi:  
777 [10.1177/103530461202300106](https://doi.org/10.1177/103530461202300106)

778 Phillips, D.E. (2006). Corporate social responsibility in aviation. *Journal of Air Transportation*  
779 11(1): 65-87.

780 Plan Vivo (2020). Mikoko Pamoja - Kenya. Available at: [https://www.planvivo.org/mikoko-](https://www.planvivo.org/mikoko-pamoja)  
781 [pamoja](https://www.planvivo.org/mikoko-pamoja) [Accessed 10/11/2020]

782 Popkin, G. (2019). How much can forests fight climate change? Available at:  
783 <https://www.nature.com/articles/d41586-019-00122-z> [Accessed 29/11/2020]

784 Porras, I., Wells, G., Stephenson, C. and Kazis, P. (2016). Ethical carbon offsetting.  
785 Guidelines and lessons from smallholder and community carbon projects. IIED, London.

786 Sandel, M. (2012). *What money can't buy: The moral limits of markets*. Allen Lane, London.

787 Schade, J. and Obergassel, W. (2014). Human rights and the Clean Development Mechanism.  
788 *Cambridge Review of International Affairs* 27(4): 717-735. doi:  
789 10.1080/09557571.2014.961407

790 Thamo, T. and Pannell, D. (2015). Challenges in developing effective policy for soil carbon  
791 sequestration: perspectives on additionality, leakage, and permanence. *Climate Policy*  
792 16(8): 973-992. doi: [10.1080/14693062.2015.1075372](https://doi.org/10.1080/14693062.2015.1075372)

793 Tolhurst, N. and Embaye, A. (2012). Carbon offsetting as a CSR strategy. In M. Pohl and N.  
794 Tolhurst (eds.), *Responsible Business: How to Manage a CSR Strategy Successfully*.  
795 Wiley: New Jersey. doi: 10.1002/9781119206156

796 Tucker, W. (2019). "Debunked: eight myths about carbon offsetting," *Ecosystem Marketplace*,  
797 19 September. Available at [https://www.ecosystemmarketplace.com/articles/debunked-](https://www.ecosystemmarketplace.com/articles/debunked-eight-myths-carbon-offsetting/)  
798 [eight-myths-carbon-offsetting/](https://www.ecosystemmarketplace.com/articles/debunked-eight-myths-carbon-offsetting/).

799 Zeppel and Beaumont (2012). Assessing motivations for carbon offsetting by environmentally  
800 certified tourism enterprises. *Anatolia* 24(3): 297-318. doi:  
801 [10.1080/13032917.2012.759982](https://doi.org/10.1080/13032917.2012.759982)

802



