

Christopher Kirkpatrick

Secretary

Commodity Futures Trading Commission ("CFTC", "Commission")

Three Lafayette Center

1155 21st Street NW

Washington, D.C. 20581

Re: Request for Information on Climate Related Financial Risk ("RFI")1

Submitted electronically

Dear Mr. Kirkpatrick,

Introduction

The Institute for Agriculture and Trade Policy (IATP)² appreciates the opportunity to respond to some of the RFI questions. Save for a July 13 letter concerning nominations to and topics for the Energy and Environmental Markets Advisory Committee, IATP last wrote to the Commission about climate-related financial risk in a co-authored September 22, 2021, letter.³ Although the RFI does not state that information received may be used in a CFTC study of compliance and voluntary carbon markets, we reiterate here our call for such a study, with an opportunity for the public to provide input and comment on the study. As we wrote then, "It has been 10 [now 11] years since the CFTC led an interagency study of carbon markets; since then, they have expanded dramatically and are expected to continue expanding as increasing numbers of companies make pledges to achieve 'net-zero' GHG emissions using offsets." (p. 2) The recommended study will provide an important foundation for any future Commission action on compliance and voluntary carbon markets.

The relation between emissions offset market expansion and contention over the terms of the pledges is politically and economically fraught. For example, members of the High-

¹ https://www.cftc.gov/sites/default/files/2022/06/2022-12302a.pdf

² IATP is a nonprofit, 501(c)(3) nongovernmental organization, headquartered in Minneapolis, Minnesota, with offices in Washington, D.C. and Berlin, Germany. IATP participated in the Commodity Markets Oversight Coalition (CMOC) from 2009 to 2015, and the Derivatives Task Force of Americans for Financial Reform since 2010. IATP has participated in the activities of the United Nations Framework Convention on Climate Change since 2007. We have been a member of an international NGO coalition, the Climate Land Action Rights Alliance, since 2010.

³ https://comments.cftc.gov/PublicComments/ViewComment.aspx?id=65876&SearchText=

Level Expert Panel of the United Nations Race to Zero campaign have been threatened with lawsuits for advising that the Race cannot be won without phasing out and down the use of fossil fuels.⁴ A detailed analysis of 25 major corporations' net zero commitments reported, "Collectively, the 25 companies specifically commit to reducing only less than 20% of their 2.7 GtCO2e emission footprint [in 2019], by their respective headline target years [2030 to 2050] (Figure S1)." Such commitments are far from what is required for net zero corporate commitments to contribute proportionately to preventing the 1.5°C overshoot, as computer modeled by the Intergovernmental Panel on Climate Change (IPCC).

The Commission does not have, of course, any authority to evaluate the integrity of net zero pledges nor to limit the use of offset spot and derivatives contracts to achieve those pledges. However, marketing materials reference the use of offset credits to achieve corporate publicized net zero targets. Critics have charged that that the use of low integrity offset credits to make net zero emissions claims amounts to little more than "greenwashing," e.g., misrepresenting a company's Environmental Social and Governance (ESG) qualifications. Greenwashing litigation concerning ESG claims has given rise to Securities and Exchange Commission rulemaking on climate-related financial risk disclosures.

The Commission should become familiar with the terms of net zero corporate standards, such as those of the Science Based Targets Initiative (SBTi), and SBTi limits on the use of offsets to achieve net zero commitments. The misrepresentation of emissions reductions claimed for offset contracts might result in litigation that will require an understanding of market participant net zero claims and the use of offsets to meet net zero targets. The Commission study that we have recommended should outline the net zero claims context of the use of offset contracts to better understand the market pressures that could lead to misuse, e.g., trading contracts that misrepresent emissions avoided, reduced or removed to achieve net zero commitments. Such misrepresentation may indicate that an offset contract is susceptible to market manipulation, in violation of Core Principle 3.

We will return to answer the RFI questions (22-24) bearing directly on VCMs. (IATP is a signatory to the Americans for Financial Reform letter on VCMs.) However, the

⁴ Thomas Hale, "Corporate pushback against climate action is getting desperate," Climate Home News, September 28, 2022. For further information about the Race to Zero campaign, see Steve Suppan, "IATP responses to the UNSG High Level Expert Group on net-zero emissions for non-state entities," Institute for Agriculture and Trade Policy, September 13, 2022. https://www.iatp.org/iatp-responses-unsg-high-level-expert-group-net-zero

⁵ "Corporate Climate Responsibility Monitor 2022: Assessing the Integrity and Transparency of Companies' Emissions Reduction and Net Zero Pledges," New Climate Institute and Carbon Market Watch, February 2022, p. 5.

⁶ Umair Irfan, "Can you really negate your carbon emissions? Carbon offsets explained," V006F, February 27, 2020.

⁷ Roger Barton, "Greenwashing wave hits securities litigation," Reuters, September 22, 2022.

Commission has asked a broad range of questions about climate-related financial risk and the derivatives markets. We will respond to some of those questions in the order they are asked. Our letter concludes with proposals on how the Commission might respond to the Financial Stability Oversight Council's recommendations in FSOC's "Climate Related Financial Risk Report." (Federal Register, p. 34857)

1. What types of data would help the Commission evaluate the climate related financial risk exposures of registered entities, registrants, and other participants in the derivative markets that the Commission oversees? Are there data sources that registered entities, registrants, and/or other market participants currently use to understand and/or assess climate-related financial risk? What steps should the Commission consider in order to have better access to consistent and reliable data to assess climate-related financial risks?

IATP would be remiss not to acknowledge first the climate related data sources in Appendix 1 of "Managing Climate Risk In The U.S. Financial System."

The Commission should have the best available consensus data about the physical risks of climate change to the physical commodities that are the underlying assets of the contracts that the Commission oversees. Although derivatives contracts are designed to manage very short term (usually 90 days to a year) price risks, the Commission should be data equipped to evaluate short term (5-10 year) climate impacts on the exchange definitions of deliverable supply and delivery points for physically backed derivatives. The days when futures prices are purported to move in response to USDA's monthly World Supply and Demand Estimates reports will soon have to build longer term climate disruptions into trading algorithms.

For example, according to a 2021 National Space and Aeronautics Administration study, global maize (corn) yields are projected to drop by 25% by 2030, while wheat yields may increase by 17%. The locations of agricultural production will change due to prolonged drought, depleted aquifers and climate change exacerbated severe weather events. It is likely that the sites of physical delivery of forward contracts, livestock auctions and derivatives contracts will change too. Climate change impacts on the nutritional composition of grains and oilseeds likely will

⁸ Climate-Related Market Risk Subcommittee (2020). Managing Climate Risk in the U.S. Financial System. Washington, D.C.: U.S. Commodity Futures Trading Commission, Market Risk Advisory Committee," pp. 160-161.

⁹ Megan Durisin, "Climate Change Will Cut Corn Yields by a Quarter by 2030, NASA Study Says," Bloomberg, November 1, 2021.

¹⁰ USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018. See Chapters 3 on Water and Chapter 10 on Agriculture and Rural Communities.

¹¹ R. Beach et al., "Combining the effects of increased atmospheric carbon dioxide on protein, iron and zinc availability and projected climate change on global diets: a modelling study," The Lancet Planetary Health, July 2019 (updated September 2020). https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(19)30094-4/fulltext

require exchanges to modify the protein and mineral requirements for deliverable supply, since import ports of entry could reject nutrient deficient shipments.

Climate disruptions of commodity transportation routes will affect the delivery points and costs of all physically backed commodities whose contracts the Commission oversee. For example, despite public funding to protect oil and gas refineries from sea rise, the deliverable supply of oil and gas, as described in futures contracts, will be disrupted more frequently and on a greater scale as a consequence of damage to refineries, pipelines and fossil fuel extraction facilities. The Commission can avail itself of the International Energy Agency's new "Weather for Energy Tracker" to better understand the impact of weather events and climate trends on generation and distribution in the underlying of energy derivatives contracts. The Commission should consider hiring or contracting with one or more climate modelers to interpret climate data and assess whether trading venue position accountability systems are sufficiently robust to anticipate and prevent climate-related market disruptions.

Data sources are proliferating that claim to manage carbon offset contract price risks through evermore complex indices, e.g., a recently announced series of offset price indices "powered" by Artificial Intelligence, that claim to "reflect the value of different types of voluntary carbon credits and enhance market transparency in the complex voluntary carbon and [United Nations' 17 Sustainable Development Goals] co-benefit markets."

The Commission will have to add data surveillance capacity, including for AI managed data, to evaluate whether these indices make offset price formation more transparent or more opaque. The Commission should be cautious about accepting the data mining and analytics claims of AI promoters, since bio-mimetic software is far from realization. Fei-Fei Li, chief scientist at Google Cloud, said of artificial intelligence, "It is very task-focused, it lacks contextual awareness, and it lacks the kind of flexible learning that humans have."

The Commission should obtain the resources to enhance staff capacity to independently verify that machine learning offset price indices effectively manage offset price risks for commercial hedgers.

The Voluntary Offset Registry Database, co-developed by the Berkley Carbon Trading Project and Carbon Direct, is an up-to-date means to track offset credit quality, credit type and other information relevant to the environmental performance of offset contracts in the four major offset registries. Tarbon Direct's "Assessing the State of the Voluntary Carbon in 2022" concludes that "The Voluntary Carbon Market has a quality problem with the continued proliferation of risky project types. Nevertheless, the Ecosystem Marketplace, which

¹² E.g., Karl Plume, "Mississippi River Barge Backlog Swells as Water Level Shrinks," Reuters, October 4, 2022, https://gcaptain.com/mississippi-river-barge-backlog-swells-as-water-levels-shrink/

¹³ E.g., Sahir Doshi, "The Oil and Gas Industry's Dangerous Response to Climate Change," Center for American Progress, August 25, 2021.

¹⁴ https://www.iea.org/data-and-statistics/data-tools/weather-for-energy-tracker

¹⁵ "S&P Global Platts to Launch Six Carbon Credit Indices, Powered by Viridios AI," Cision PR Newswire, August 23, 2021.

¹⁶ Fei-Fei Li, cited in "Q+A," ("The Artificial Intelligence Issue") *MIT Technology Review*, Vol. 120:6, November-December 2017, at 26.

¹⁷ https://gspp.berkeley.edu/faculty-and-impact/centers/cepp/projects/berkeley-carbon-trading-project/offsets-database

¹⁸ https://www.carbon-direct.com/insights/assessing-the-state-of-the-voluntary-carbon-market-in-2022

aggregates and anonymizes registry reported offset credit sales, notes a sharp increase, reaching \$1 billion by the end of 2021. The Commission may need to prepare to analyze carbon price bubbles that pop as the risky project types result in a proliferation of poor-quality offset credits publicized by investigative reporters.

Under one policy scenario that assumes tighter VCM rules and presumably higher quality offset credits, Bloomberg NEF researchers project a \$190 billion market in annual offset sales by 2030. The Commission should develop the capacity to analyze the registry verified projects underlying the carbon prices that are "sliced and diced" in the price indices that are the underlying assets for offset futures contracts, such as the CME's Global Emissions Offset (GEO) and Nature Based GEO (N-GEO) futures contracts. The Commission should not wait for boom-and-bust price market events to issue a Special Call for VCM trading and price data to better understand the contracts traded on exchanges and cleared by organizations overseen by the Commission.

The closure of the Chicago Climate Exchange is usually attributed to the failure of the U.S. Congress to pass a cap-and-trade bill.²¹ However, the projected growth of VCMs is not just a matter of increasing the integrity of offset credits. Policy decisions will also factor into trading prices and volume, e.g., a VCM supportive implementation of Article 6.4 of the Paris Agreement (see our response to question 34) and policies for massive government subsidies and tax credits to finance the construction of private carbon capture and storage facilities and pipelines. VCM adverse policies could disrupt the projected upward trend in VCM prices.

3. What steps should the Commission consider to better inform the public of its efforts to assess and address climate related financial risks? What information could the Commission publish that would be useful in this regard? What steps should the Commission consider to make climate related data more available to registrants, registered entities, other market participants, and/or the public (as appropriate and subject to any applicable data confidentiality requirements) in order to help understand and/or manage climate related financial risk?

Part of the purpose of this RFI is to help inform the activities of the Commission's Climate Risk Unit (CRU). One way to better inform the public about climate risk in the asset classes, contracts and markets the Commission oversees is to organize a Climate Risk Information Hub within CRU with spokes for each of the asset classes and contract types, and spokes for different kinds of climate-related transition risk information, e.g., insurance, interest rate policy, commodity transportation news, etc. and a spoke for climate science news. For example, in an enforcement

¹⁹ "Voluntary Carbon Markets Top \$1 Billion in 2021, with Newly Reported Trades: A Special Ecosystem Marketplace COP 26 Bulletin," November 10, 2026.

https://www.ecosystemmarketplace.com/articles/voluntary-carbon-markets-top-1-billion-in-2021-with-newly-reported-trades-special-ecosystem-marketplace-cop26-bulletin/

²⁰ Jagteshwar Singh and Tiffanie Tan, "Carbon prices may rise 3000% by 2029 with tighter rules," Bloomberg Professional Services, March 3, 2022. https://www.bloomberg.com/professional/blog/carbon-offsets-price-may-rise-3000-by-2029-under-tighter-rules/

²¹ E.g., Nathanial Gronewold, "Chicago Climate Exchange Closes Nation's First Cap-and-Trade System, but Keeps an Eye to the Future," The New York Times, January 3, 2011.

https://archive.nytimes.com/www.nytimes.com/cwire/2011/01/03/03climatewire-chicago-climate-exchange-closes-but-keeps-ey-78598.html?pagewanted=1

spoke, both the public and participants in Renewable Energy Certificates futures trading could be informed about a Department of Justice study of fraud in REC credits.²² Proposals to combat offset credit fraud²³ could likewise be included.

Exchanges and broker dealers post unwarranted articles along with daily and historical prices for spot and futures contracts. The Commission currently posts a small selection of articles and customer advisories, many oriented to fraud prevention. ²⁴ If the CRU lacks the resources to organize and maintain a Climate Risk Information Hub, the Commission should at least post alerts about carbon trading fraud and the Interpol "Guide to Carbon Trading Crime." ²⁵

Scenario Analysis and Stress Testing

4. Are there any climate forecasts, scenarios, or other data tools that would be useful to the Commission, registered entities, and/or registrants to better understand the exposure of any registered entities or registrants to climate-related financial risk and how those risks translate to economic and financial impacts?

"Managing Climate Risk in the U.S. Financial System" summarizes one of the greatest climate-related data challenges to the Commission, to exchanges and to market participants: "Traditional risk-modeling techniques, which rely heavily on historical data, will become increasingly unhelpful guides to the future. That presents a significant challenge to financial market participants and regulators, whose decisions hinge on having good information and data on which to ground their views about future conditions." The anticipatory purpose and practice of futures markets might lead one to think that the report's observations do not apply or applies less to futures market risk modeling.

However, a just released report by Ceres on modifying risk modeling techniques to incorporate climate variables in interest rate derivatives shows how the largest bank counterparties could apply "loan equivalent risk" data to climate-oriented bank risk modeling. ²⁷ IATP does not have expertise in financial derivatives but believes that that the Commission can and must find and use future oriented data sources for physically backed derivatives to develop climate-related risk modeling for those contracts.

https://www.justice.gov/usao/page/file/1460731/download

https://www.osti.gov/servlets/purl/1855012

²² Wayne D. Hettenbach and Lauren D. Steele, "The Past May Be Prologue: Energy Credit Fraud and Its Lessons for Carbon Credit Systems," Department of Justice Journal of Federal Law and Practice: Environmental Crimes, Vol. 69, No. 6 (December 2021), p. 79-100.

²³ Brian P. Dwyer and Curtis D. Mowry, "Minimizing Fraud in the Carbon Offset Market Using Blockchain Technologies," Sandia National Laboratories, 2016.

²⁴ https://www.cftc.gov/LearnAndProtect/AdvisoriesAndArticles/index.htm

²⁵ Environmental Crime Programme, Interpol, June 2013.

²⁶ Op cit., p. 25

²⁷ "Derivatives and Bank Climate Risk: Financing a Net Zero Economy," Ceres Accelerator for Sustainable Capital Markets, September 2020, p. 11. https://www.ceres.org/sites/default/files/reports/2022-09/Ceres%20Derivatives%20and%20Bank%20Climate%20Risk%20Report%202022_0.pdf

Most climate risk scenario analysis pertains to central banks and Systemically Important Financial Institutions (SIFIs). However, the "Managing Climate Risk" authors note that "Subsystemic shocks can result, for example, in businesses, farmers, and residents in particular communities losing access to hedging instruments, insurance, credit, and other critical financial services. In turn, that loss of access can result in business disruptions, lost income, and reduced household wealth. Over time, repeated sub-systemic shocks could lead to the gradual accumulation of stress in the U.S. financial system and to escalating economic and financial losses—a systemic crisis in slow motion."²⁸ Derivatives contracts that do not price climate risk into contract design and trading algorithms can amplify, rather than absorb shocks and transfer climate—related financial risks to counterparties least able to manage those risks. "Managing Climate Risk" illustrates subsystemic risk with the example of agricultural borrower exposure to physical climate risks in the Midwest.²⁹ However, in our analysis of a Farm Credit Administration's proposed rulemaking to revise FCA's bank liquidity reserve, we could find no evidence that FCA considers climate change to pose a subsystemic risk and has begun to revise its rules and supervisory guidance to manage that risk in its loan and bond portfolios.³⁰

6. Is a long-term (e.g., 30-year or 50- year) stress testing scenario relevant for derivatives markets subject to CFTC oversight? Is there a more relevant set of forward-looking climate relevant scenarios? Should these scenarios account for geographical stress? Should these scenarios try to target certain asset types? Can scenarios be customized to be more relevant for certain types of derivatives markets or registered entities?

"Managing Climate Risk" recommendations to the CFTC include stress testing of central counterparties and market infrastructure.³¹ In our view, the time horizon for stress testing scenarios should be no longer than 2030, when climate tipping points will begin to increase the frequency and severity of climate impacts.³² Current climate modeling will be challenged to provide reliable and geographically specific climate information after 2030 for stress testing purposes. Realistic stress testing of central counterparties should be informed by the results of climate scenario analysis for derivatives market participants, particularly commercial hedgers in physically backed contracts. A challenge for the Commission is to provide or develop scenario analysis models for market participants' use. If climate stress tests result in higher capital and margin collateral requirements without market participant experience of scenario analysis applied to their trading strategies, the requirements could seem arbitrary and be subject to litigation by financial lobbies.

7. Should registered entities and registrants be required to incorporate climate stress tests into their risk management processes? Do registered entities and registrants have the capability currently to conduct

²⁸ Op cit., p. 27.

²⁹ Op cit., Figure 3.4, p. 35.

³⁰ Steve Suppan, "IATP's letter to FCA on the bank liquidity reserve rule," Institute for Agriculture and Trade Policy, November 26, 2021. https://www.iatp.org/documents/iatp-letter-fca-bank-liquidity-reserve-rule

³¹ Op. cit., p. 126.

³² Henry Fountain, "Failure to Slow Climate Warming Will Set Off 'Tipping Points,' Scientists Say," The New York Times, September 8, 2022.

climate related stress tests? If not, what would be needed in order to achieve this capability and on what timeline?

This requirement, although prudent, assumes register entity and registrant capacity. Because of the heterogeneity of registrant business models, the Commission would have to develop stress test model types, beginning with the SIFIs that participate in derivatives market as swaps dealers. Thresholds for stress testing should not only be determined by annual notional value of trading, but also by interconnectedness to the number of distinct asset classes and to non-U.S., as well as to U.S. markets. Any climate stress testing should be beta tested and phased in. Given the expense of stress testing, the Commission should consider exempting registrants below a certain threshold.

12. Should the Commission consider amending its minimum capital and liquidity requirements to better recognize climate-related risks?

The context for our response here includes our responses to questions 4, 6 and 7 on climate scenario analysis and central counterparty stress testing. Amending minimum capital and liquidity requirements assumes the central counterparties will cooperate with regulators to incorporate their estimated climate related financial risks. While there is a strong business case for central counterparties to cooperate with the Commission to amend minimum capital and liquidity requirements to reduce climate related financial risk vulnerabilities, there will be a lot of political pressure on central counterparties to reject these prudent measures and instead rely on insurance and/or central banks to bail out imprudent financial actors. However, insurers already buckling under indemnifications for increasingly frequent, severe and geographically widespread climate events³³ may view imprudent central counterparties as uninsurable.

The Commission should also consider amending margin collateral requirements for trading in contracts that have not incorporated climate risks into deliverable supply, delivery points and other features of contract design. Such amendments are likely to be controversial among exchanges, intermediaries and market participants, so a lot of research will be needed to justify the amendments as necessary for the market to function well for commercial hedgers in physically backed derivatives.

Disclosure

13. The Commission staff is evaluating the Commission's public disclosure, including public information, requirements to assess whether existing requirements need to be updated to effectively provide decision-useful, consistent, and comparable information on climate related risks. Are there ways in which updated disclosure requirements could aid market participants in better assessing climate-related risks?

The general state of disclosure of climate-related financial risk for the most carbon intensive companies is a state of denial. Some of these companies hedge price risks in U.S. markets. Carbon Tracker's review of more than 130 companies, estimated to account for 80% of global corporate

³³ E.g., Simon Mundy, Tamami Shimizuishi and Kristin Talman, "Climate risk takes insurance sector by storm," Financial Times, February 9, 2022.

emissions, found that 98% of their financial statements contained no evidence of their climate-related financial risks.³⁴ According to Climate Disclosure Project analysis, only 1% of corporate climate-related financial disclosures elicit information that is investor useful for equities.³⁵ Derivatives trading disclosures present a different challenge because of the distinct statutes, entities and purposes of derivatives trading.

The Commission already requires Commodity Trade Advisors (CTAs), Commodity Futures Merchants and Introducing Brokers to make several disclosures to clients, e.g., to disclose proprietary trading that may conflict with the client's interests.³⁶ In addition to the general Statement of Risk Disclosure, CTAs who offer to trade for clients'swaps, options, and/or off-exchange foreign exchange trading must advise on the specific risks of those contracts. Climate-related financial risk disclosure should be added to this disclosure regime. For example, the risks of emissions avoidance-based contracts, including reversals due to severe weather events, such as forest fires, should be disclosed. Likewise, the climate-related financial risks of technology-based emissions removal contracts (currently few but projected to grow in number and price), such as technology failure, should be disclosed. If the underlying of offset derivates contracts include offset credits from protocols that have verified credits despite allegations of fraud or misrepresentation of emissions avoided, reduced or removed, CTAs should disclose those allegations, e.g., through links to court filings or police records.

The Securities and Exchange Commission's proposed disclosure of climate-related financial information as material for investors has a strong legal foundation.³⁷ Nevertheless, industry groups, Republican Senators and Republican Attorneys General have threatened to sue the SEC all the way to the Supreme Court to nullify the proposed rule once it is finalized.³⁸ It would be surprising if opponents of SEC climate risk disclosure did not likewise oppose in court any proposed CFTC climate-related disclosure requirements, even from market participants trading emissions offset futures contracts to achieve publicly declared net zero emissions commitments. A CFTC climate risk disclosure rule likely will face opposition rooted in what the late, great climate economist Frank Ackerman called in 2008 "the fear that overly ambitious climate initiatives could hurt the economy. Economists emphasizing that fear have, in effect, replaced the climate skeptics as the intellectual enablers of inaction."³⁹

Notwithstanding political opposition to climate-related financial disclosures, the Commission should amend its Statement of Risk Disclosure to include climate-related disclosures to protect

³⁴ Camilla Hodgson, "Auditors fall down on climate risk as corporate polluters fail basic tests, study shows," Financial Times, October 7, 2022. https://www.ft.com/content/9e9a035f-9009-4b48-b3e1-b88595a7cb71

³⁵ Simon Jessup, Tommy Wilkes and Elizabeth Howcroft, "Almost all corporate climate disclosures are inadequate, says CDP," Reuters, March 3, 2022.

³⁶ https://www.law.cornell.edu/cfr/text/17/4.34

³⁷ Fisch, Jill E. and Georgiev, George S. and Nagy, Donna M. and Williams, Cynthia A., Comment Letter of Securities Law Scholars on the SEC's Authority to Pursue Climate-Related Disclosure (June 6, 2022), at 2. Available at SSRN: https://ssrn.com/abstract=4129614 or https://dx.doi.org/10.2139/ssrn.4129614

³⁸ E.g., Ellen Meyers, "Legal debate over SEC's authority clouds climate rule proposal," Roll Call, May 5, 2022

³⁹ Frank Ackerman, "Climate Economics in Four Easy Pieces," *Development* (2008) at 325. http://frankackerman.com/publications/climatechange/Climate Economics Four Easy Pieces.pdf

clients from undisclosed climate- related financial risks in contracts, whether exchange certified or Commission approved, on Commission regulated Designated Contract Markets or Swaps Execution Facilities.

Voluntary Carbon Markets

22. Are there ways in which the Commission could enhance the integrity of voluntary carbon markets and foster transparency, fairness, and liquidity in those markets?

As proposed elsewhere in this letter, the Commission should use its disclosure, registration, record keeping and reporting regimes to ensure that emissions offset credits traded in spot markets or as the underlying of emissions offset futures contracts comply with all Core Principles and regulations. Because VCM offset credit standards have been developed and will be governed outside the CFTC's regulatory framework, it will be difficult for the Commission to directly influence the work of the Integrity Council for Voluntary Carbon Markets (IC VCM), the Voluntary Carbon Market Initiative (VCMI), the International Emissions Trading Association (IETA) and other likeminded organizations.

For example, "ISDA [International Swaps and Derivatives Association] is focused on developing strong legal standards to encourage consistency in the definition of VCCs [Voluntary Carbon Credits], as well as provide clarity on the bankruptcy and regulatory treatment in key jurisdictions for both primary and secondary markets." Having set the legal table for trading such financial products as credit default swaps, ISDA is now helping to create another financial innovation, including setting the terms for bankruptcy as a result of trading the innovation in the most remunerative jurisdictions. However, a global market failure in the trading of offset credits and offset derivatives has climate related consequences that cannot be remedied in bankruptcy court or even by massive central bank bailouts of major swaps dealers. The Commission should develop its own offset trading definitions, rules and guidance, even if it recognizes that the work of private standards can increase the current level of environmental, social and accounting integrity in emissions offset credits.

An IETA survey of market participants reported that they projected the price of the Chicago Mercantile Exchange's Global Emissions Offset (GEO) futures contract would jump from \$4/mt CO2 equivalent in June 2022 to an average of \$35.14 between 2002 and 2025 and \$48.58 between 2026 and 2030.42 What are the policy assumptions underlying such econometric projects? Among IETA's policy priorities is "No limit to the number of transactions and transfers of ITMOs [Internationally Transferred Mitigation Outcomes, i.e., offset credits]" after their first sale from Parties [to the UN Framework Agreement on Climate Change] to Non-Parties [private sector or

⁴⁰ "Voluntary Carbon Markets: Analysis of Regulatory Oversight in the U.S.," International Swaps and Derivatives Organization, June 2022, p. 2. https://www.isda.org/a/93WgE/Voluntary-Carbon-Markets-Analysis-of-Regulatory-Oversight-in-the-US.pdf

⁴¹ James Felkerson, "\$29,000,000,000,000: A Detailed Look at the Fed's Bailout by Funding Facility and Recipient," Levy Economics Institute, Working Paper No. 698. December 2011. https://www.levyinstitute.org/pubs/wp_698.pdf

⁴² Max Tingyao Lin, "Record high prices forecast across global carbon markets, and still room for more," Clean Energy News, June 23, 2022.

sub-federal government entities].⁴³ Parties to the Paris Agreement may agree with IETA's priorities, since IETA members are included on some Party delegations.⁴⁴ However, how do IETA's priorities comport with CFTC rules and Core Principles? For example, if there are no limits on offset credit transactions in the cash and futures markets, how will the Commission fulfill its obligations to "diminish, eliminate or prevent excessive speculation"?⁴⁵

In our view, emissions offset futures contracts are novel and complex instruments because of the well documented and frequent instances of fraud, misrepresentation of emissions reductions and human rights violations by offset project developers, as summarized in the Americans for Financial Reform response to the RFI that IATP has signed. By comparison, underlying assets of emissions allowance permits and Renewable Energy Credits for futures contracts overseen by the Commission are relatively simple instruments. The Commission should review and formally approve or disapprove emissions offset futures contracts, rather than allow exchanges to certify such contracts to be exchange certified. ⁴⁶ The CFTC will do VCMs no favors by accepting private standards, governance structure, limitless trading of offset contracts, and exchange certification of new products with no staff study and no Commission review.

The Commission, not private standards organizations, should set definitions and other provisions for trading emissions offset derivatives. Here is one definition and an explanatory rationale that IATP proposed to the SEC for reporting disclosure of the use of offsets as a part of business plans to manage climate related transition risks.

"Suggested amendments to the proposed Regulation S-K climate disclosure terms"

The SEC defines "carbon offsets" as follows:47

[From Section 229.1500 (Item 1500) Definitions.]

Carbon offsets represents an emissions reduction or removal of greenhouse gases ("GHG") in a manner calculated and traced for the purpose of offsetting an entity's GHG emissions.

"We suggest that the proposed definition of carbon offsets be clarified in the following ways:

⁴³ "IETA Views and Priorities for Article 6 [of the UNFCCC Paris Agreement]," October 2021, p. 4. https://www.ieta.org/resources/COP26/IETA-Views-and-Priorities-for-Article-6-(2021).pdf

https://www.ieta.org/resources/COP26/1ETA-Views-and-Priorities-for-Article-6-(2021).pdf 44 "Primer: IETA, Big Polluters and the UNFCCC," corporate Accountability, 2018, p. 2.

 $https://www.corporateaccountability.org/wp-content/uploads/2018/04/CA_Bonn_Cop24_2018_webEN.pdf \ https://www.law.cornell.edu/uscode/text/7/6a$

 ⁴⁶ Steve Suppan, "Will the CFTC greenlight an emission offset market boom (and bust)?" Institute for Agriculture and Trade Policy, September 28, 2021. https://www.iatp.org/search?keys=CFTC+greenlight
 47 The proposed amendments to the PR's definition for "carbon offsets" was developed and agreed by an ad hoc Offsets Working Group coordinated by Americans for Financial Reform. IATP participated in that Working Group.

Carbon offsets represents an emissions <u>avoidance</u>, reduction or removal of greenhouse gases ("GHG") in a manner calculated and traced for the purpose of offsetting <u>or</u> compensating for an entity's GHG emissions.

We believe it is important to distinguish between two types of climate action for which offset credits are created: the avoidance of emissions into the atmosphere in the first place and the removal of GHGs from the atmosphere. We believe that adding the word "avoidance" in the definition better captures the full range of offset projects and the terminology used in the industry. The category of emissions avoidance is frequently further segmented in the offset market into avoided emissions (for example, avoided deforestation) and reduced emissions (for example, through fuel switching). Some market actors, including the recently concluded Task Force on Scaling Voluntary Carbon Markets (TSVCM), collapse avoided and reduced emissions together (avoidance/reduction credits), reflecting the difficulty in always clearly distinguishing between them. There are also "mixed" projects, such as integrated forest management projects, where both avoidance and removals offsets may be generated.

We note that "[O]ffsetting an entity's GHG emissions" is not a clear statement of what an offset does or does not do. Removals are the only type of offset that, theoretically, could change the *net* carbon emissions of a firm. *Avoidance* offsets, while potentially contributing to climate action, may lead in aggregate to fewer overall emissions (though please note the many caveats regarding offset integrity that we describe in response to question 2), but in no way could they "compensate for" the ongoing emissions of the registrant.

To compensate for fossil fuel emissions, which have a lifetime in the atmosphere of hundreds to thousands of years, permanent removals are required. Most offset credits available for trading are not for removals but for avoided emissions. Existing removal offsets are mostly for temporary land-based sequestration — sequestration which faces the risk of reversal from wildfires and other disruptions and can lead to the loss of the value of credits that have already been purchased.

Some registries set aside a buffer pool of credits, held off the market to compensate for the claimed emissions avoided or reduced that are reversed by wildfires and other extreme events. However, as wildfires and other severe events, such as floods that reverse soil sequestration reduction claims, increase in severity and frequency, the efficacy and financial value of buffer pools will diminish, perhaps dramatically.⁴⁸ As a result, both registrants buying offsets from registries with buffer pools and investors in those registrants will have to monitor whether offset credits truly represent the absolute emissions reductions claimed by registrants in their reporting to the SEC."⁴⁹

This proposed definition is merely illustrative of what the Commission might do towards developing independent oversight of offset trading, rather than adopting the standards and definitions from industry organizations. The regulatory means to aid successful management of climate-related physical and transition risk are far too important to be left primarily to private organizations.

⁴⁸ Gilles Dufrasne, "Up in smoke—California fires once again highlight dangers of forest offsets," Carbon Market Watch. October 22, 2020.

⁴⁹ https://www.iatp.org/documents/iatp-comment-sec-proposed-rule-enhancement-and-standardization-climate-related, pp. 24-25.

23. Are there aspects of the voluntary carbon markets that are susceptible to fraud and manipulation and/or merit enhanced Commission oversight?

Numerous studies have analyzed flaws in the environmental, social and accounting integrity of offset emissions credits and offset emissions protocols. ⁵⁰ According to a TSVCM survey in 2020 of buyers and prospective buyers of carbon offset and removal credits, 45% of those surveyed were concerned about "a lack of environmental and social integrity of certain [offset] projects." ⁵¹ The concerns are not detailed in the survey, as they are documented in the AFR letter, but they likely include accounting fraud or misrepresentation of emissions reductions and human rights violations by offset project developers whose projects were nevertheless verified as meeting verification protocol standards to enable those credits to be bought, sold and re-sold. These survey results were among the factors that lead to the formation of the IC VCM to attack the persistent problems of offset credit integrity. IC VCM has developed a highly detailed standard and assessment framework for such widely used protocols as Verra and the American Carbon Registry to quality to have their offset credits tagged with the IC VCM's Core Carbon Principle (CCP) plus attributes for specific credit types and claims, such as technology-removal based credits.

IATP responded to some of the scores of IC VCM survey questions concerning the CCP and the Assessment Framework for determining whether verification protocol credits met the IC VCM requirements to have the protocol credits tagged as "CCP" for trading. There is no way to summarize our yet unpublished responses, so we provide part of a sample response here:

The Criterion 1.3 of the Assessment Framework provides a good start for science-based carbon crediting: "The carbon-crediting program shall have established and shall adhere to procedures and requirements for the development, approval and regular updating of all normative program documents based on the best available science, including provisions for expert input and incorporation of lessons learned from program operation." (p. 7) This criterion should be further developed as a principle to be required in Core Carbon Principle CCPs) referenced contracts. The draft CCPs lack a Principle of IPCC science-based carbon crediting that CCP referenced contracts, as well as the assessment of carbon crediting programs, incorporate the consensus findings of climate science, as developed by the Intergovernmental Panel on Climate Change. For example, biogenic offsets cannot compensate for fossil fuel generated greenhouse gases on a 1:1 ratio, according to the 6th Intergovernmental Panel on Climate Change (IPCC) Assessment report (Chapter 5) and peer reviewed literature referenced in the report. More simply put, it is physically impossible for short cycle biological carbon to offset long cycle geological carbon emissions.

⁵⁰ Studies expressing concerns about the integrity of voluntary carbon markets were summarized in an open letter to the Task Force on Scaling Voluntary Carbon Markets sent by 47 academics and other researchers in January 2021 letter entitled, "Is Scaling Up Voluntary Carbon Markets Really What the Climate Needs?," https://greenfinanceobservatory.org/wp-content/uploads/2021/01/Scaling-up-GFO-analysis-

⁵¹ "Public Consultation Report," Task Force on Scaling Voluntary Carbon Markets, May 20, 2021, (Slide 50). https://www.iif.com/Portals/1/Files/TSVCM Public Consultation.pdf

⁵² Zickfeld, K., Azevedo, D., Mathesius, S. *et al.* Asymmetry in the climate–carbon cycle response to positive and negative CO₂ emissions. *Nat. Clim. Chang.* **11**, 613–617 (2021). https://doi.org/10.1038/s41558-021-01061-2

The Commission should be alarmed that sales of low integrity credits, such as those of Verra, provide data for the underlying price index of the CME Nature Based Emissions offset futures contract. A No wonder CME seeks to exempt itself from fraud and other integrity concerns associated with its contract: The Exchange makes no representation respecting the authenticity, validity or accuracy of any Notice of Intention to Accept, Notice of Intention to Deliver, check or of any document or instrument delivered pursuant to these rules. So Nevertheless, the Commission allowed CME to certify that its contract is compliant with all Commission rules and Core Principles, including Core Principle 3, which concerns the susceptibility of the contract to market manipulation. We find CME's self-certification of the contract as providing no evidence of the documentation required by the Core Principle 3 Appendix to demonstrate compliance with Core Principle 3.

As IATP wrote to the Commission in our co-authored letter last year, the CME self-certified offsets futures contracts offered no public access to the prices of the underlying asset: "As a result of this pricing opacity, it will be difficult to determine whether price discovery in offset futures trading converges with the cash price for offset credits underlying the futures contract as that contract nears its expiration date. If there is no price convergence, the offset futures contract cannot serve as a price benchmark for commercial hedgers investing in the underlying cash market. A futures contract without price convergence benefits only speculators and the exchanges receiving trading and data fees." Furthermore, price opacity provides a cover for market manipulation. The Commission should not wait for price convergence failure to occur in in these offset futures contracts. The Commission should announce a formal review of all CME emissions offset futures contracts and their underlying assets and require filing of documentation to demonstrate compliance with all Core Principles. We understand that the Commission does not have the resources do formal reviews of each of the flood of new products authorized by the Commodity Futures Modernization Act of 2000. But novel contracts that will be models for future such contracts surely merit more than a cursory review of DCM application paperwork.

24. Should the Commission consider creating some form of registration framework for any market participants within the voluntary carbon markets to enhance the integrity of the voluntary carbon markets? If so, what would a registration framework entail?

VCM proponents project a huge increase in the value, price and volume of emissions offset contract trading in the spot and derivatives markets. For example, the TCVCM projected a 15-fold increase in carbon credit trading by 2030 with a notional value of perhaps more than \$50 billion a year by 2030. We don't know what the policy assumptions and economic models are for this huge jump over the current \$1 billion notional value of offset trading. However, even if the 2030 market value is one-quarter of what is claimed, a registration framework is required to ensure

⁵³ "Verra's Broadside against the Integrity Council Props up the Status Quo." *CarbonPlan*, 29 Sept. 2022, https://carbonplan.org/research/verra-integrity-council

⁵⁴ https://www.cftc.gov/sites/default/files/filings/ptc/21/07/ptc072921nymexdcm001.pdf, p. 11.

⁵⁵ Op. cit., p. 7.

https://comments.cftc.gov/PublicComments/ViewComment.aspx?id=65876&SearchText=, p. 10

⁵⁷ Simon H, "Demand for carbon credits could increase 15X by 2030, 100X by 2050," Carbon Credit.com, July 29, 2021.

compliance with the 23 Core Principles for the Designated Contract Markets and Swaps Execution Facilities⁵⁸ on which offset credits and offset futures will trade.

Registration alone cannot reverse engineer low quality offset credits to make them higher quality and less risky transactions. However, registering Commodity Trade Advisors, Introducing Brokers, Futures Commission Merchants, Swaps Dealers and other intermediaries at least provides some assurance that they will inform their clients about the specific risks of trading and pricing low quality voluntary carbon credits (VCCs). Furthermore, registration triggers record keeping and reporting requirements that can help make VCM trading less opaque. IATP is among those who advocate the registration of offset verification protocols. If the VCM market goes boom and bust, the registered VCM credits can be tagged to enable CFTC data surveillance for trading anomalies, if Congress grants the agency sufficient resources for surveillance of this and other new asset classes.

IATP is surprised at how many unregistered entities will risk CFTC enforcement actions, given the relatively low costs of registration. However, given the global enthusiasm for trading VCCs of whatever integrity, the Commission should consider increasing the size of fines for first offenders and imposing "bad actor" requirements on repeat offenders.

Digital Assets

25. Are digital asset markets creating climate-related financial risk for CFTC registrants, registered entities, other derivatives market participants, or derivatives markets? Are there any aspects of climate-related financial risk related to digital assets that the Commission should address within its statutory authority? Do digital assets and/or distributed ledger technology offer climate-related financial risk mitigating benefits?

IATP wrote to the Commission on May 11 to analyze the risks of the FTX application to amend its Derivatives Clearing Organization designation to allow it to fully automate re-margining collateral and clearing. ⁵⁹ We strongly discouraged Commission approval of the FTX application. Likewise, we strongly oppose Commission approval or exchange self-certification of the tokenization of retired low integrity offset credits for trading as carbon crypto tokens.

CarbonPlan characterized this financial innovation as "Zombies on the blockchain." Blockchain based tokens originate from some of the verification protocols and registries referenced in this letter, including Verra. CarbonPlan estimates that 21.6 million Verified Carbon Units had migrated from registries to the blockchain as of April 2022. The "bridging" from the registry to the crypto tokens further erodes the integrity of the VCU. The ensuing carbon crypto price bubble has burst, taking with it retail investor funds that would have been much better spent as

 $^{^{58}\} https://www.federalregister.gov/documents/2012/06/19/2012-12746/core-principles-and-other-requirements-for-designated-contract-markets$

⁵⁹ https://comments.cftc.gov/PublicComments/CommentList.aspx?id=7254

⁶⁰ G. Badgley and D. Cullenward (2022) "Zombies on the blockchain," https://carbonplan.org/research/toucan-crypto-offsets

donations to projects that mitigate emissions or adapt to climate change. Greenwashing crypto has been the main product of crypto carbon joint ventures.⁶¹

Financial Stability Oversight Council Considerations

33. What steps should the Commission consider in order to expand its capacity to define, identify, measure, monitor, assess, and report on climate-related financial risks and their effects on financial stability? For example, what factors should the Commission consider when it looks to prioritize staffing, training and expertise on climate-related issues? Which analytic, data modeling, and monitoring methodologies would be helpful to the Commission in this regard?

If they [offset emissions project developers] generate a lower carbon benefit than they claim and the company [buying such offset credits] is still emitting, well then you end up with more emissions than you would have otherwise, . . . We have to be open to the idea that the voluntary market might fail. Eli Mitchell-Larson, a climate scientist advising TSCVM

The RFI states, "A key recommendation is that [FSOC] member agencies, consistent with their legal authority, "expand their respective capacities to define, identify, measure, monitor, assess, and report on climate related financial risks and their effects on financial stability." (FR 34857-34858) IATP urges the Commission to carry out a "worst case economics" assessment of the climate related financial risks of the environmental integrity failure of VCMs. ⁶³ Policy scenario factors in such a "green swan" ⁶⁴ type assessment would include the aforementioned VCM failures; rapid and widespread devaluations of offset spot and derivatives contracts held by major market participants; corporate stranded assets; damage to corporate assets and supply chains from more frequent and severe climate-related events triggered by "tipping points;" ⁶⁵ inability of climate modelers to provide businesses and regulators with granular data for re-investment decisions and hedging; ⁶⁶ inadequate and delayed insurance indemnifications; defaults among the market

⁶¹ Camilla Hodgson and Siddharth Venkataramakrishnan, "Crypto and climate change: can web3 get us to net zero?" Financial Times, August 28, 2022. https://www.ft.com/content/1f795e5d-c2cf-4e91-89f1-6d5544a8a3db

⁶² Jeff Shankleman and Akshat Rathi, "Wall Street's Favorite Climate Solution Mired in Disagreements," Bloomberg Green, June 2, 2021. https://www.iatp.org/documents/iatp-comment-task-force-scaling-voluntary-carbon-markets-phase-ii-public-consultation, p. 2.

⁶³ Ackerman, Worst Case Economics: Extreme Events in Climate and Finance, Anthem Press, 2017 and related materials at https://frankackerman.com/worst-case-economics/

⁶⁴ Helen Rey, "Green swan' events pose new threat to financial stability," China Daily, July 23, 2021. https://www.chinadaily.com.cn/a/202107/23/WS60fa1602a310efa1bd663d80.html

⁶⁵ Timothy M. Lenton et al, "Climate tipping points—too risky to bet against," Nature, Vol. 575, November 28, 2019.

⁶⁶ Tanya Fiedler et al, "Business risk and the emergence of climate analytics," *Nature Climate Change*, Vol. 11, February 2021.

participations with the heaviest debt loads⁶⁷ and least ability to refinance debt; defaults among Derivatives Clearing Organization members and finally among the DCOs themselves. IATP believes that offset spot and derivatives markets are vulnerable to sub-systemic risks and that the assessment we recommend here is consistent with both Recommendations 4.3 and 4.11 of "Managing Climate Risk in the U.S. Financial System."⁶⁸

Central bankers generally recognize that "green swan" climate-related financial events are far more likely than "black swan" financial market failures because the global frequency and severity of climate events triggered by "tipping points" is more likely than global swaps dealer failures aided by regulatory and oversight failures. ⁶⁹ In our view, central bank bailouts of major market participants would be far more difficult to structure to avoid climate triggered corporate default cascades if only because of the number and variety of corporations and other market participants vulnerable to a chain of "green swan" events. The Commission is not a prudential regulator, but it has a prudential duty of care to ensure that self-regulated VCMs do not contribute to offset market events that exacerbate financial instability.

34. How should the Commission coordinate its efforts with international groups and other regulatory bodies and supervisors? Are there standards, definitions, or metrics that could facilitate the sharing of relevant climate related information amongst regulatory bodies and supervisors, and/or their analyses and aggregation of climate related data? Are there specific steps that could be taken to enhance global coordination and regulatory comity?

Chair Rostin Behnam is leading the International Organization of Securities Commission (IOSCO) study of VCMs announced in March. Although IOSCO's 140 jurisdictions are not obliged to implement any recommendations resulting from IOSCO work, this is nonetheless an important opportunity for the Commission to "export" its best practices, research and guidance for this study and any future IOSCO work on VCMs. We urge the Commission to hold a public meeting about the IOSCO study and ensure that there is ample opportunity for public comment on the draft IOSCO VCM consultation document.

The Commission will likely need to revise its comparability determinations with other jurisdictions if it adopts guidance or rules concerning VCMs. Although comparability determinations are with individual jurisdictions, Commission staff can use the IOSCO meetings

⁶⁷ Brendan Cole, "A \$10 Trillion Corporate Debt Bomb Is Waiting to Explode the U.S. Economy," Newsweek, July 29, 2020. Robert Smith and Tom Braithwaite, "Debt monsters in the downturn," Financial Times, September 12, 2022. https://www.ft.com/content/e5a807a5-a65f-4885-ab5f-871d545e36a3 ⁶⁸ Op. Cit., p. vii.

⁶⁹ Patrick Bolton et al., "The green swan: Central banks and financial stability in the age of climate change," Bank for International Settlements and Banque de France, January 2020. https://www.bis.org/publ/othp31.pdf

⁷⁰ "IOSCO's 2022 Sustainable Finance work plan strengthens the organization's commitment to increasing transparency and mitigating greenwashing," International Organization of Securities Commissions, March 14, 2022. https://www.iosco.org/news/pdf/IOSCONEWS635.pdf

for initial discussions about amending comparability determinations regarding VCM relevant guidance and rules.

Last but surely not least, the Commission should remain up to date about the implementation of Article 6.4 of the Paris Agreement, which governs sales of offset credits from governments to "non-Parties," mostly the private sector but also sub-federal governments. A flash point in the negotiations has been and will be the Share of Proceeds (SOPs) to pay for adaptation projects in the most climate vulnerable countries and to the UNFCCC to underwrite the costs of setting up and operating the registry of the offset sales. Since the collections of SOPs could be the responsibility of Designated Contract Markets overseen by the Commission, these negotiations are relevant to the Commission's oversight.

The State Department represents the United States government at these negotiations, so the Commission has no authority to opine about the SOPs or other aspects of the Article 6.4 negotiations. IETA, in its October 2021 priorities, strongly opposed a high level of SOPs for Article 6.4 and none for Article 6.2, which governs the sale and registry of offsets among governments. In our unpublished comments on the IC VCM consultation paper, we wrote, "IATP agrees with the Carbon Market Watch position that SOPs 'must apply to Article 6.4 but should also apply to 6.2. If Parties cannot find agreement, then a clear mechanism is needed for developed countries to channel adaptation finance to developing countries." IATP supports the expedited implementation of Article 6.8 for public finance of adaptation projects. According to the former IPCC co-chair for mitigation, "Neither the amount of financial flows nor their direction is sufficient to keep temperatures below 2 °C, let alone 1.5 °C." 72

Conclusion

IATP thanks the Commission for this opportunity to share our information and views to assist the Climate Risk Unit and to develop guidance and rulemakings to enable market participants, intermediaries, DCMs and DCOs to manage climate-related risks in the spot and derivatives markets.

Respectfully submitted,

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⁷¹ "In-Depth Q&A: How 'Article 6' carbon markets could 'make or break' the Paris Agreement,) Carbon Market Watch, November 29, 2019. https://www.carbonbrief.org/in-depth-q-and-a-how-article-6-carbon-markets-could-make-or-break-the-paris-agreement/

⁷² Cited in Sophie Yeo, "Where climate cash is flowing and why it is not enough," Nature, September 17, 2019. https://www.nature.com/articles/d41586-019-02712-3