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A BACKDOOR FOR FOSSIL FUEL PROTECTION: HOW EXTENDING ECT COVERAGE TO CCUS, HYDROGEN, AND AMMONIA WILL LOCK-IN OIL & GAS

Briefing

Extending protection under the Energy Charter Treaty (ECT) to investments in carbon capture, utilization and storage, hydrogen, and ammonia, among other emerging energy technologies and products, could hamper the ability of States to end reliance on fossil fuels. It could also discourage States from adequately regulating technological responses to climate change that risk harming human rights and the environment. This briefing explains why.

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Summary and Key Findings

Extending protection under the Energy Charter Treaty (ECT) to investments in carbon capture, utilization and storage, hydrogen, and ammonia, among other emerging energy technologies and products, could hamper the ability of States to end reliance on fossil fuels. It could also discourage States from adequately regulating technological responses to climate change that risk harming human rights and the environment. This briefing explains why.

Key Findings:

- Including carbon capture, utilization, and storage (CCUS), hydrogen, ammonia, synfuels, and methanol in the ECT serves as a backdoor extension of protection for fossil fuels because each is dependent on fossil fuels directly or indirectly, and all are promoted by the fossil fuel industry to justify its ongoing operations.
- These new technological applications pose diverse challenges and significant risks, and protection under the ECT, including access to investor-state dispute settlement (ISDS), may stifle State Parties' ability to appropriately regulate emerging challenges.
- Protections under the ECT could keep States from taking measures necessary to restrict and regulate the deployment of these technologies as their dangers become more apparent, or to roll back incentives when they prove ineffective or counterproductive to climate action.
- Exclusions from Treaty coverage put forward by the European Union (EU), the United Kingdom (UK), and Switzerland have significant loopholes and do not eliminate many protections for fossil fuels.
- The risks associated with extending the ECT to cover CCUS, hydrogen, ammonia, synfuels, methanol, and biomass/biogas are yet another reason that Parties should reject the modernized ECT and withdraw from the Treaty altogether.

Introduction

The Energy Charter Treaty (ECT) is a multilateral agreement designed to protect foreign investment in the energy sector. One of the ways it purports to do so is by allowing foreign investors to haul host States into arbitration in the event of a dispute, particularly when investors allege that regulatory change or other State action adversely affects their returns or unfairly imposes costs on them. While other investment treaties include similar provisions, the ECT has been the most frequently invoked treaty in investor-State arbitration.[1] In June 2022, the State Parties to the ECT reached an agreement in principle on reforms to the Treaty. The agreed modifications will become final if adopted at the Energy Charter Conference in November 2022. A communication[2] issued by the Treaty secretariat outlined select changes, and a leaked version of the "modernization text"[3] provides further details regarding the revisions. In the lead-up to the Conference, Parties are engaged in heated debates at the national and regional levels about whether to endorse the new Treaty, remain under the old version, or withdraw from the agreement altogether, as a growing number of countries are opting to do.[4]

Among the negotiated changes is the extension of ECT protection to investments in carbon capture, utilization and storage (CCUS) as well as hydrogen, ammonia, synfuel, and biomass/biogas.[5] The latter are added without qualification as to their carbon intensity or distinction between fossil fuel-dependent or renewable-based energy sources that would fall under those categories. Expanding the categories of "economic activity in the energy sector" and "energy materials and products" covered by the ECT in this way would mean that investors in the

[1] See International Centre for the Settlement of Investment Disputes, *Caseload Statistics 2022-1*, icsid.worldbank.org/sites/default/files/documents/The_ICSID_Caseload_Statistics.1_Edition_ENG.pdf; and Lea Di Salvatore, *Investor–State Disputes in the Fossil Fuel Industry*, International Institute for Sustainable Development (December 2021), at iv, www.iisd.org/system/files/2022-01/investor%E2%80%93state-disputes-fossil-fuel-industry.pdf.

[2] See Communication of the Secretary General on the modernisation of the Energy Charter Treaty (1 July 2022), www.energycharter.org/media/news/article/communication-of-the-secretary-general-on-the-modernisation-of-the-energy-charter-treaty.

[3] See leaked document at www.bilaterals.org/IMG/pdf/reformed_ect_text.pdf [hereinafter Reformed ECT].

[4] The Polish parliament voted by majority to exit the ECT, see vote from the Polish Parliament (vote No. 39) of 6 of October 2022, sejm.gov.pl/Sejm9.nsf/agent.xsp?symbol=glosowania&NrKadencji=9&NrPosiedzenia=63&NrGlosowania=39. The Netherlands announced their wish to withdraw from the Treaty, see tweet from Christine Teunissen, Member of the Second Chamber of the States-General of the Netherlands, twitter.com/Ct_teunissen/status/1539636217804775424. On 12 October 2022, Spain began the process of withdrawing from the Energy Charter Treaty over climate concerns, see POLITICO, *Spain pulls out of energy treaty over climate concerns* (12 October 2022), www.politico.eu/article/spain-pulls-out-of-energy-treaty-over-climate-concerns/?utm_source=POLITICO.EU&utm_campaign=38960aea51-EMAIL_CAMPAIGN_2022_10_13_05_14&utm_medium=email&utm_term=0_10959edeb5-38960aea51-190854908. The European Parliament voted in favour of considering a coordinated exit from the ECT, see Committee on International Trade, *Report on the future of EU international investment policy* (2021/2176(INI)) (25 May 2022), www.europarl.europa.eu/doceo/document/A-9-2022-0166_EN.pdf. And The French Minister Delegate to the Minister for Europe and Foreign Affairs in charge of Foreign Trade said at the French National Assembly a on the 4th of October, a coordinated withdrawal of the EU from the ECT is still on the table, see tweet from Deputy for the Loire Atlantique in France twitter.com/laernoes/status/1577366789436096514.

[5] See Reformed ECT, Art. 1(5), at 7; Annex EMI, at 123-24. This briefing focuses primarily on concerns related to the extension of ECT protection to CCUS, hydrogen, and ammonia, and to a lesser extent methanol and synfuel, due to their links to fossil fuels. While the proposed extension of ECT coverage to biomass/biogas is not discussed here, it, too, poses significant risks and is controversial. See, e.g., Biofuelwatch, *Open Letter Opposing the Energy Charter Treaty and the Proposed Inclusion of Biomass Energy in It* (undated), www.biofuelwatch.org.uk/2021/ect-biomass-lette. For further discussion of biomass/biogas and relevant resources, see *infra*, section on *Extension of Coverage* and footnotes 20.

newly listed technologies and products could have recourse to investor-State dispute settlement (ISDS) under the Treaty.[6] ISDS allows covered investors to seek compensation from the State when policy change or other State action imposes costs on them or infringes on their returns. Making ISDS available to additional categories of investments would likely expand the number of investor claims against States party to the Treaty, adding to the already substantial impediment that ISDS claims pose to States' willingness and ability to take ambitious climate action, including by phasing out fossil fuels, or otherwise regulate to prevent adverse environmental and social impacts.[7]

Because investments in carbon capture, hydrogen, and ammonia will only further entrench reliance on fossil fuels, protecting them under the ECT could lock in that reliance in a number of ways:

First, including carbon capture, hydrogen, and ammonia in the ECT serves as a backdoor extension of protection for fossil fuels because each is dependent on fossil fuels directly or indirectly, and all are promoted by the fossil fuel industry to justify its ongoing operations. CCUS is parasitic on fossil fuel- or biomass-burning facilities. Its function is to keep those combustion-based facilities operating longer on the promise of reducing their carbon emissions, but in reality, it has repeatedly failed to do so.[8] Moreover, captured carbon dioxide is often used to pump more out of the ground through enhanced oil recovery (EOR).[9] The result is prolonged reliance on fossil fuels.

Hydrogen, ammonia, and synfuel all depend on fossil fuel inputs to varying degrees. The vast majority of hydrogen produced today, for example, is derived from fossil gas,[10] and ammonia is produced with hydrogen through an energy-intensive process.[11] Projections indicate that fossil gas will remain the primary source of hydrogen through mid-century.[12] So-called "blue hydrogen," which constitutes the majority of proposed new hydrogen production, is just fossil hydrogen (dubbed "brown" if made from coal or "gray" if made from gas) with carbon capture and storage

[6] See Reformed ECT, Art. 26.
[7] See generally CIEL, *Investors v. Climate Action* (Sept. 9, 2022), www.ciel.org/investors-v-climate-action; IIED, Kyla Tienhaara and Lorenzo Cotula, *Raising the cost of climate action? Investor-state dispute settlement and compensation for stranded fossil fuel assets* (2020), www.iied.org/17660iied.
[8] See Center for International Environmental Law, *Confronting the Myth of Carbon-Free Fossil Fuels: Why Carbon Capture Is Not a Climate Solution* (Washington DC: CIEL, 2021), www.ciel.org/reports/carboncapture-is-not-a-climate-solution; see also *infra*, section *Carbon Capture, Utilization and Storage* and the sources cited therein.
[9] See Institute for Energy Economics and Financial Analysis (IEEFA), *The Carbon Capture Crux: Lessons Learned* (2022), at 10, ieefa.org/resources/carbon-capture-crux-lessons-learned.
[10] IEA, *Hydrogen Supply: Tracking Report* (Sept. 2022), www.iea.org/reports/hydrogen-supply ("Practically all dedicated hydrogen production (more than 99%) is currently based on fossil fuels, mainly the steam reforming of natural gas and coal gasification.").
[11] The Royal Society, Ammonia: zero-carbon fertiliser, fuel and energy store (2020), at 13-15, royalsociety.org/-/media/policy/projects/green-ammonia/green-ammonia-policy-briefing.pdf
[12] In its Net Zero by 2050 report, for example, the IEA projects that 40 percent of hydrogen production in 2050 will still come from fossil gas. IEA, *Net Zero by 2050: A Roadmap for the Global Energy Sector* (Paris: IEA, May 2021), at 161, iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf. Earlier predictions from the US Department of Energy projected that "by 2050, fossil fuels will remain the primary source of hydrogen for the United States (~75%), Europe (~65%), and Japan (~85%)." Office of Fossil Energy, US Department of Energy, *Hydrogen Strategy: Enabling a Low-Carbon Economy (Washington DC: US Dept. of Energy* (2020), at 1, www.energy.gov/sites/prod/files/2020/07/f76/USDOE_FE_Hydrogen_Strategy_July2020.pdf.

(CCS). Green hydrogen is produced from water using renewable energy.[13] But the main text of the revised ECT that adds hydrogen to the list of covered energy materials and products does not distinguish between blue, green, or any other type of hydrogen, nor does it specify anything regarding fossil inputs or emissions intensity of ammonia or synfuel production processes. (In a proposed annex to the ECT, some countries have qualified the coverage of hydrogen within their jurisdictions, as discussed further below.) Because of these links, protecting investments in these technologies and materials indirectly protects the production and use of oil, gas, and coal, as State action affecting fossil fuels or fossil fuel facilities could be attacked by investors in these new technologies as adversely affecting their returns.

Second, extending investor protections to these technologies and materials will limit States' ability to develop regulations needed to address the risks and adverse impacts that they present. Current regulations are inadequate to restrain the deployment of these risky technologies and products or otherwise prevent, manage, and mitigate the foreseeable harms they may cause. The purported climate benefits of CCUS or of hydrogen and ammonia as energy products remain speculative and unproven at scale; to the extent that their use delays or detracts from urgently needed, available, and proven mitigation measures, like replacing fossil fuels with renewables and reducing energy demand, they actively undermine the energy transition.

On top of these fundamental concerns about their ultimate impact on the climate and just transition, the deployment of CCUS, hydrogen, and ammonia presents myriad other risks. For example, uncertainties abound with respect to the safe transportation and storage of compressed carbon dioxide and liability for leaks; the management of hydrogen, which is more combustible than fossil gas and is itself an indirect greenhouse gas; the ability (or lack thereof) to safely use ammonia, a highly toxic and corrosive chemical, as a transportation fuel; and how to properly regulate the production and use of a diverse set of synthetic fuels. Moreover, technologies that entrench reliance on fossil fuels exacerbate the harmful effects of fossil fuel industry pollution and its climate consequences, which fall disproportionately on marginalized communities.[14] These and other risks to people, the environment, and the climate have not even been fully assessed, let alone sufficiently addressed through policy and regulations. Protecting investments in CCUS, hydrogen, and ammonia could keep governments from adopting and updating rules and regulations to restrict their production and use or impose necessary safeguards.

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[13] The Royal Society, *Ammonia: zero-carbon fertiliser, fuel and energy store* (2020), at 15, royalsociety.org/-/media/policy/projects/green-ammonia/green-ammonia-policy-briefing.pdf.

[14] See Baskut Tuncak (Special Rapporteur on the Implications for Human Rights of the Environmentally Sound Management and Disposal of Hazardous Substances and Wastes), *Rep. on Twenty-Five Years of the Mandate on Toxics*, para. 11, U.N. Doc. A/75/290 (Aug. 5, 2020) (finding that communities of color, marginalized and low-income communities are more likely to reside or work in proximity to polluting industrial facilities). In the United States, multiple studies document the heightened exposure of Black and low- income communities to pollution from fossil fuel power plants and other industrial sources. See, e.g., Maninder P. S. Thind et al., *Fine Particulate Air Pollution from Electricity Generation in the US: Health Impacts by Race, Income, and Geography*, Environ. Sci. Technol. 2019, 53, 23, 14010–14019; M*ikati et al.*, Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status, Am. J. Public Health, 108, 480-485 (2018).

Third, allowing investors in CCUS, hydrogen, ammonia, and synfuel to sue States in investor-State arbitration when changes in the regulatory regime diminish their returns would threaten to lock in incentives and subsidies for these technologies or products — even if they prove inefficient or ineffective from an energy or climate perspective, or misguided economically. This is a particular risk for carbon capture projects, which have repeatedly failed to perform as promised by proponents, and which, if required to meet high performance standards, would, in many cases, prove unviable. To date, CCUS projects have over-promised and under-delivered on emissions reductions,[15] and in the United States, where tax subsidies for carbon capture have been in place for years, an investigation in 2019 revealed that nearly $1 billion in credits had been improperly claimed for projects that did not provide adequate documentation that the carbon was captured.[16] Studies show that so-called "blue hydrogen" – hydrogen produced from fossil gas with CCS – is actually more emissions-intensive than burning gas or coal directly.[17] Thus it may well become clear that using public funds to incentivize investment in these activities and products is counterproductive for the climate, but with ECT protection, investors could claim compensable harm for the loss of such funding.[18]

Cementing in place investment protections for these technologies risks locking in fossil fuels — at precisely the moment when they need to be phased out and when pressure is mounting on States to do just that. CCUS, hydrogen, and ammonia are dependent on fossil fuels and are part of a broader narrative that seeks not to replace combustion-based fuel sources with renewable energy and energy demand reduction but to substitute one fossil-derived fuel for another. Such approaches distract from the urgent need to rapidly reduce fossil fuel production and use, and retire and replace fossil fuel infrastructure. They also threaten to divert energy and resources from investing in proven solutions.

This document provides a brief overview of the relationship between these newly covered technologies and products to fossil fuels, and the risks of their inclusion within the ECT.

[15] See, e.g., IEEFA, *The Carbon Capture Crux: Lessons Learned* (2022), ieefa.org/resources/carbon-capture-crux-lessons-learned.
[16] U.S. Senator, Robert Menendez, www.menendez.senate.gov/download/report-45q-tigta; *see also* Tom Pelton, Oil & Gas Watch, *Investigation: Carbon capture tax credits in climate bill riddled with verification failures and other problems*, (Aug. 31, 2022), news.oilandgaswatch.org/post/investigation-carbon-capture-tax-credits-in-climate-bill-riddled-with-verification-failures-and-other-problems.
[17] Robert Howarth and Mark Jacobson, *How Green is Blue Hydrogen?* (2021), onlinelibrary.wiley.com/doi/full/10.1002/ese3.956.
[18] Article 17bis in the Reformed ECT provides that "the mere fact that a subsidy or grant has not been issued, renewed or maintained, or has been modified or reduced by a Contracting Party or has been ordered to be reimbursed by a competent court, administrative tribunal or other competent authority of that Contracting Party, shall not constitute a breach of the provisions of Part III of the Treaty, even if there is loss or damage to the Investment as a result." This offers some assurance against compensation claims for reduction or loss of access to subsidies, like the claims lodged against Spain for changing its incentive framework for renewables. But the impact of the provision depends on what qualifies as a subsidy or grant–or in the case of the EU, what constitutes "state aid." See Reformed ECT, Art. 17bis. Some incentive regimes may not.

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Understanding the Proposed Changes: What is Included, What is Excluded, and What is Let Back In

Among the negotiated changes to the ECT are amendments that extend the Treaty's investment protections to new categories of energy activity and products, and amendments that exclude investments in certain energy activities and products from coverage.

Extension of Coverage

The ECT protects assets associated with an "Economic Activity in the Energy Sector," which is defined in relation to protected "energy materials and products" listed in Annexes EM I and II, and not excluded under Annex NI. Among the proposed changes to the ECT is the addition of "capture, utilisation and storage of carbon dioxide in order to decarbonise the energy system" to the definition of "Economic Activity in the Energy Sector," alongside "the exploration, extraction, refining, production, storage, land transport, transmission, distribution, trade, marketing, or sale of Energy Materials and Products." The modernized text also adds to the list of "Energy Materials and Products" in Annex EM I hydrogen, anhydrous ammonia[19], methanol, biomass, biogas (defined as gaseous fuels produced from biomass), and synthetic fuels (defined as fuels which are synthesized from hydrogen and carbon streams). No qualifications are included regarding the carbon- or emissions-intensity or the fossil fuel dependence of energy sources that would fall under those categories. For example, no distinction is drawn between hydrogen generated from water using renewable power (so-called "green" hydrogen) and hydrogen generated from coal or fossil gas (so-called "brown" or "gray" hydrogen), which industry has coined "blue" if coupled with CCS, as discussed further below. Thus, as written, the reforms would extend coverage to hydrogen produced from coal or methane, as well as synthetic fuels derived from carbon-heavy feedstocks and biomass without restriction.

BIOMASS AND BIOGAS

Biomass and biogas are fuels produced from trees, plants, vegetable waste, or other organic matter and then used as an energy source. Biomass plants and the cultivation and use of their source materials are often associated with significant adverse social and environmental impacts, including massive carbon emissions and other toxic air pollution, deforestation, biodiversity loss, displacement, and violations of land rights.[20]

Significant concerns surround the use of biogas, which is primarily methane, particularly biogas generated from factory farm waste.[21]

[19] Anhydrous ammonia refers to ammonia in its pure form, without any water. Throughout this briefing, and for simplicity, we refer to ammonia.

[20] See NGO Position Paper, *To protect nature and the climate, we must reform how bioenergy is treated in the EU's Renewable Energy Directive* (2021), www.fern.org/fileadmin/uploads/fern/Documents/2021/RED_-_NGO_Position_Paper__1_.pdf.

[21] See, e.g., Food & Water Watch, *Biogas from Factory Farm Waste Has No Place in Clean Energy Future* (2021), www.foodandwaterwatch.org/wp-content/uploads/2021/03/ib_1906_biogas_manure-2019-web.pdf .

Monoculture plantations for biogas, biofuels, bioenergy with carbon capture and storage (BECCS), or other biomass production, may depend on fossil fuel-based inputs, such as agrochemicals, and energy sources to power agricultural equipment and are subject to the same risks associated with CCS described in this briefing. More fundamentally, due to the amount of land and water required, BECCS can have significant adverse effects on food and water security, which increase with the scale of the deployment. [22]

As others argue, given the many harmful impacts of biomass, "[i]t is likely that states will want to raise social and environmental standards for biomass plants, for instance by introducing stronger emission standards to prevent a negative impact on local resident's health or by mandating that the feedstock needs to come from sustainable sources." [23]

Extending ISDS protections to biomass and biogas while there are still significant unresolved (and potentially unresolvable) problems with the acquisition of land and significant water, fertilizer, and energy inputs for such purposes could insulate investors in these sectors from regulations preventing or mitigating these risks or efforts to impose liability and hold them accountable for harms associated with such projects.[24]

Exclusion from Coverage – and Its Loopholes

A limited number of energy materials and products are excluded from ECT coverage in all Contracting Parties under Section A of Annex NI. Those include oil distilled from coal tar and fuel wood.[25] Although some Parties and many advocates demanded that the revised ECT should exclude protection for all future fossil fuel investments or end coverage of existing such investments, it does not. Instead, it allows Parties to the Treaty "flexibility" to exclude select energy materials or products and related economic activities from coverage in the future under Section B of the Treaty's Annex NI.

To date, only the EU, UK, and Switzerland have elected to do so. While much attention has been paid to what those States have excluded from ECT coverage in their respective "carve-outs," less attention has been paid to what they let back in through extensive loopholes. Despite their links to fossil fuels, CCUS, hydrogen, and ammonia are not fully removed from ECT coverage under the carve-outs. Rather, as discussed below, those energy products and technologies become the vehicle through which the EU and UK extend Treaty protection to fossil gas investments for decades into the future.

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[22] See IPCC, *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* (2019), at 67,www.ipcc.ch/srccl.
[23] See CAN Europe, *Analysis of the EU proposal to change the Definition of Economic Activity in the Energy Sector as part of the modernisation of the Energy Charter Treaty* (February 2001), caneurope.org/content/uploads/2021/02/Analysis-of-the-COM-proposal-for-ECT-modernisation-on-the-Definition-of-Economic-Activity-in-the-Energy-Sector_February-2021.pdf.
[24] For more on the problems with biomass and dangers of investment protection for biomass, see Biomass Basics, biofuelwatch, www.biofuelwatch.org.uk/2018/biomass-basics-2/ (last visited Oct. 10, 2022); Center for Biological Diversity, Forest Biomass Energy Is a False Solution (2021), www.biologicaldiversity.org/campaigns/debunking_the_biomass_myth/pdfs/Forest-Bioenergy-Briefing-Book-March-2021.pdf.
[25] See Reformed ECT, Annex NI, Sec. A.

Carve-outs for New Investments

The EU and UK, for example, have agreed to carve out from the revised ECT "new" fossil fuel investments made after 15 August 2023, but with significant exceptions. The EU exempts from this future investment carve-out so-called "low-carbon" hydrogen, defined as "hydrogen produced from non-renewable sources, with significantly reduced full life-cycle emissions resulting in less than 3tCO2eq/tH2" and "renewable hydrogen," meaning "hydrogen produced from renewable sources, with the exception of biomass, resulting in full life-cycle emissions of less than 3tCO2eq/tH2."[26] In other words, hydrogen produced from fossil gas (methane), biomass, or coal may be protected under the ECT – regardless of the source of the energy that powers the production process, whether fossil fuels or renewables – provided lifecycle emissions are less than the designated level. Although the EU has excluded investments in "new economic activities concerning the capture, utilisation and storage of carbon dioxide" from ECT coverage after 15 August 2023,[27] so-called "low-carbon" hydrogen is predicated on carbon capture. Thus, in allowing coverage of fossil hydrogen investments, the EU effectively allows coverage of investments in the CCS on which that hydrogen depends.

Though the emissions threshold for "low-carbon" hydrogen is set at 3 tons of CO_2e[28] per ton of hydrogen and may appear relatively stringent, significant questions about implementation, monitoring, reporting, and verification remain. As noted by the International Energy Agency (IEA), the average lifecycle emissions intensity of steam methane reforming (SMR) fossil gas into hydrogen is between 11 and 14 tons of CO_2e per ton H_2, with 9 tons of CO_2e coming from production and 2-5 tons of CO_2e attributable to upstream emissions.[29] A limit of 3 tons of CO_2e per ton of H_2 would amount to a 70-80% reduction in emissions intensity, and therefore, would require some combination of carbon capture and reduced upstream emissions. Accurate accounting of upstream emissions from fossil gas production – routinely under-reported[30] – thus will be key to ensuring investments in hydrogen that exceed the emissions-intensity threshold are not protected. Moreover, it is not clear from the language proposed by the EU what degree of performance hydrogen facilities would need to achieve to receive protection or how they would need to demonstrate the requisite compliance with the emissions-intensity threshold. Specifically, it is unclear whether a hydrogen production facility would have to demonstrate compliance all the time or, on average, merely show that it has the capacity to achieve the specified lifecycle emissions-intensity target. Either way, verifying a hydrogen production investment's compliance with this standard before determining whether it qualifies for ECT protection will be challenging, to say the least.

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[26] See Reformed ECT, Annex NI, Sec. B.1(a), at 142.
[27] See Reformed ECT, Annex NI, Sec. B.1(a).
[28] CO2eq and CO2e are used interchangeably.
[29] IEA, *Global Hydrogen Review 2021* (2021), at 128-29, iea.blob.core.windows.net/assets/5bd46d7b-906a-4429-abda-e9c507a62341/GlobalHydrogenReview2021.pdf.
[30] See IEA, *Global Methane Tracker 2022 - Overview* (2022), www.iea.org/reports/global-methane-tracker-2022/overview ("Globally, our analysis finds that methane emissions from the energy sector are about 70% greater than the sum of estimates submitted by national governments.").

The EU carve-out also includes an exception for "low-carbon" synthetic fuels, defined as "recycled carbon fuels, low-carbon hydrogen and synthetic gaseous and liquid fuels produced from low-carbon hydrogen, which meet a 70% reduction in full life-cycle emissions."[31] Again, letting these fuels back into ECT coverage effectively lets the fossil fuels on which they are based back in, too.

Moreover, the EU has largely exempted gas power facilities and infrastructure from the exclusion, extending ECT coverage to gas-fired power plants that are *capable* of using "renewable" and "low-carbon" gasses (where low-carbon is defined as "emitting less than 380 g of CO_2 of fossil fuel origin per kWh of electricity"), and gas pipelines that can transport "safe and sustainable renewable and low-carbon gases, *including hydrogen*" (emphasis added).[32] This "hydrogen-ready" loophole effectively allows for extended coverage of fossil gas investments into the future without any guarantee that those facilities will, in fact, transport renewable or so-called low-carbon gases.[33] Nor does the text of the carve-out in Annex NI explain how the capability of infrastructure would be assessed or claims to be "hydrogen-ready" verified.

The UK has taken a similar approach, but with arguably even more vaguely defined and expansive exceptions to the fossil fuel carve-out. The UK excludes new investments in hydrogen from ECT coverage but then lets back in investments in "low-carbon hydrogen," which it defines as hydrogen that meets the UK's Low Carbon Hydrogen Standard as published when the investment is made. Thus while the text of the carve-out does not specify an emissions intensity threshold for covered hydrogen, it incorporates by reference the intensity threshold set under UK domestic policy.[34] It does not, however, clarify how an investor's compliance with that threshold would be demonstrated or verified, or the accuracy of lifecycle emissions ensured. The UK also exempts from the carve-out gas-fired power plants using CCS "where life-cycle greenhouse gas emissions are significantly reduced" and gas pipelines "capable of transporting renewable and low carbon gases."[35] "Significant reduction" is not defined in the text of the agreement, nor is the standard for assessing pipeline capability.

Like the EU and UK, Switzerland excludes investments in hydrogen made after 15 August 2023 from ECT coverage except for "low carbon hydrogen and renewable hydrogen," which it defines as "fossil-based hydrogen and electricity based hydrogen" with lifecycle emissions of less than 3 tons of CO_2e/ton H_2. Switzerland also allows protection of new investment in synthetic fuels with lifecycle emissions that are at least 70% lower than synthetic fuels produced from fossil fuels with

[31] See Reformed ECT, Annex NI, Sec. B.1(a).
[32] See Reformed ECT, Annex NI, Sec. B.1(b).
[33] See Reformed ECT, Annex NI, Sec. B.1(b).
[34] See UK Department for Business, Energy, & Industrial Strategy, *UK Low Carbon Hydrogen Standard Guidance on the greenhouse gas emissions and sustainability criteria* (2022), at 11, assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1092809/low-carbon-hydrogen-standard-guidance-v2.1.pdf ("To demonstrate compliance with the low carbon hydrogen standard, producers of low carbon hydrogen must be able to report a GHG emissions intensity of 20gCO_2e/MJ_{LHV} of produced hydrogen or less.").
[35] Reformed ECT, Annex NI, B.3.

no "abatement" (i.e., without CCS).[36] As with the approach taken by the EU and UK, Switzerland's reliance on emissions intensity and lifecycle emissions standards raises the same concerns about verification and compliance. An emissions intensity standard is only as good as the emissions calculations are accurate and enforceable.

The loopholes in the EU and UK carve-outs with respect to gas plants and infrastructure echo the heavily criticized decision by the EU Parliament in July 2022 to include fossil gas in the EU taxonomy[37] of "environmentally sustainable economic activities," which guides funding to so-called "green investments." Gas is not only responsible for sky-high energy bills across Europe, but it is also responsible for significant greenhouse gas emissions. Despite the persistent myth of fossil gas as "bridge fuel" and its misleading moniker, "natural" gas, fossil gas releases vast amounts of methane, a potent greenhouse gas, as well as carbon dioxide, putting its warming potential on par with or above that of oil and coal.[38] In September 2022, four NGOs sued the European Commission over the inclusion of gas in the taxonomy, arguing that it is contrary to the European Climate Law and Paris obligations.[39]

Treatment of Existing Fossil Fuel Investments

Existing fossil fuel investments will remain protected under the EU and UK carve-outs for longer than the headlines would have readers believe[40] and for far longer than is consistent with avoiding catastrophic climate change. Both the EU and UK have proposed to exclude existing fossil fuels from coverage after ten years following the entry into force of the agreement, but that could itself take years. The EU's commitment contemplates that existing fossil fuel investments may enjoy ECT protection as late as 31 December 2040. While the UK would phase out the protection of existing coal investments after 1 October 2024, it would extend the protection of other existing fossil fuel investments for ten years after the entry into force of the agreement. Moreover, in a major loophole, it exempts from these exclusions existing investments in gas plants and infrastructure using CCS where lifecycle greenhouse gases (GHGs) are "significantly reduced" and transport and transmission infrastructure "capable of transporting renewable and low carbon

[36] Reformed ECT, Annex NI, B.2.
[37] See Commission delegated regulation (EU) 2022/1214 amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities (March 9, 2022), finance.ec.europa.eu/publications/eu-taxonomy-complementary-climate-delegated-act-accelerate-decarbonisation_en. For additional information on the EU taxonomy, see finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en.
[38] See, e.g., Robert Howarth, *A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas*, 2(2) Energy Science and Engineering 47 (2014), onlinelibrary.wiley.com/doi/pdf/10.1002/ese3.35; *see also* Oil Change Int'l, Burning the Gas 'Bridge Fuel' Myth: Why Gas is Not Clean, Cheap or Necessary (2019), priceofoil.org/content/uploads/2019/05/gasBridgeMyth_web-FINAL.pdf; IEA, *Global Methane Tracker 2022 - Overview* (2022), https://www.iea.org/reports/global-methane-tracker-2022/overview (finding that methane emissions from the energy sector are ~ 70% greater than national estimates indicate).
[39] See ClientEarth Press release, *EU Taxonomy: Environmental groups start legal action against 'sustainable' gas classification* (September 19, 2022), www.clientearth.org/latest/press-office/press/eu-taxonomy-environmental-groups-start-legal-action-against-sustainable-gas-classification.
[40] See, e.g., Climate Home News, *EU and UK will end investment protection for fossil fuels in 10 years* (June 24, 2022), www.climatechangenews.com/2022/06/24/eu-and-uk-will-end-investment-protection-for-fossil-fuels-in-10-year.

gases."[41] In other words, the majority of fossil fuel investments will remain protected for at least another decade, perhaps until 2040, and some indefinitely.

Beyond the EU and UK, fossil fuel investments will continue to enjoy the full protection of the ECT.

The latest climate science confirms that preventing catastrophic levels of warming requires immediately halting new investments in oil, gas, and coal and accelerating the shut down of all existing fossil fuel infrastructure. The carve-outs contemplated by the EU and the UK fall woefully short – both in terms of their scope and their timeline.[42] They not only fail to facilitate rapid phaseout in line with climate science, but they also create loopholes for more fossil fuel and fossil fuel-reliant investments, thereby delaying the necessary transition to a fossil-free future.

The Risks of Extending ECT Coverage to CCUS, Hydrogen, and Ammonia

As discussed below, CCUS, hydrogen, and ammonia are each tied to fossil fuel facilities and/or dependent on fossil fuel inputs, making investments in them tantamount to an investment in fossil fuels. Each also poses risks to the environment, health, and safety, some of which are not fully understood, making it critical that States adequately regulate them, restrain deployment and prevent harm, and strengthen those regulations as new information about risks and impacts emerges. But extending investment protection to investments in these technologies threatens the ability of States to do just that.

Carbon Capture, Utilization and Storage

CCS and CCUS technologies are not only unnecessary for the rapid transformation required to keep warming under 1.5°C, but they also delay that transformation, providing the fossil fuel industry with a license to continue polluting. CCUS does not remove carbon from the atmosphere, and in fact, worsens the climate crisis when used to boost oil production when used in EOR.

Point-source carbon capture, utilization, and storage (CCUS) is a purported carbon dioxide control technology, but in reality, just entrenches the underlying pollution source to which it is applied.[43] Primarily, CCUS has not been proven feasible or economic at scale and can only contain a fraction of source emissions. CCUS projects have a long track record of over-promising and under-delivering on the capture of CO_2 emissions from the underlying source. While proponents

[41] See Reformed ECT, Annex NI, Sec. C.1.
[42] See CIEL, IISD, Client Earth, *The New Energy Charter Treaty in Light of the Climate Emergency* (2022), www.ciel.org/the-new-energy-charter-treaty-in-light-of-the-climate-emergency; see also CAN Europe, *Do Not Resuscitate: How Energy Charter Treaty Reform Could Resurrect a Climate Monster* (July 2022), caneurope.org/content/uploads/2022/07/Energy-Charter-Treaty_Why-withdrawal-is-better-than-adopting-the-reform_July-2022.pdf
[43] See CIEL, *Confronting the Myth of Carbon-Free Fossil Fuels: Why Carbon Capture Is Not a Climate Solution* (2021), www.ciel.org/wp-content/uploads/2021/07/Confronting-the-Myth-of-Carbon-Free-Fossil-Fuels.pdf.

claim and models assume that CCS projects capture 90% of CO_2 emissions, in practice, no facilities have achieved that rate consistently or over time, and many have never come close.[44] Moreover, where CCS is used to pump more oil out of the ground through EOR, it contributes to further emissions from the burning of the oil that wouldn't have been extracted without EOR.[45] Of the estimated 300 megatons (MT) of CO_2 captured historically, approximately 80-90% of it has been used for EOR; currently, 75% of captured CO_2 is used for EOR.[46]

Second, CCUS prolongs dependence on fossil fuels and delays their replacement with renewable alternatives.[47] CCUS is parasitic on an underlying polluting facility, and so by its nature, serves to justify the continued activity to which it is applied. Finally, CCUS creates environmental, health, and safety risks for communities saddled with CCUS infrastructure, such as pipelines and underground storage. In addition to failing as a climate solution, it exacerbates the pollutant impacts of fossil-fueled facilities while creating additional risks.

CCS Links to Fossil Fuels

CCS is linked to fossil fuel in three fundamental ways, and including CCS in ECT protections may serve as a route to protect all of these uses of fossil fuels. Primarily, CCS necessarily operates on an underlying emitting facility. To the extent that CCS is applied to coal and gas power plants or petrochemical facilities, it is directly connected to ongoing fossil fuel production and consumption.

Beyond the direct application of CCS to fossil fuel facilities, CCS is also connected to fossil fuels through the practice of EOR. EOR, or "tertiary recovery," is the process of using a substance, often carbon dioxide, to stimulate additional oil production from fields that have otherwise stopped producing.[48] EOR has been practiced extensively in the United States and, as noted above, remains the destination for the majority of carbon dioxide captured for storage globally. As such, a CCS project, even if not connected to fossil fuels at the capture stage (e.g., if attached to a biomass plant or ethanol refinery), could contribute to ongoing oil production downstream.

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[44] See IEEFA, *The Carbon Capture Crux: Lessons Learned* (2022), at Appendix I, 77-78, ieefa.org/resources/carbon-capture-crux-lessons-learned.
[45] See IEEFA, *The Carbon Capture Crux: Lessons Learned*, at 9.
[46] See IEEFA, *The Carbon Capture Crux: Lessons Learned*, at 10.
[47] See, e.g., Karin Rives, *Only still-operating carbon capture project battled technical issues in 2021*, *S&P Global* (January 6, 2022), www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/only-still-operating-carbon-capture-project-battled-technical-issues-in-2021-68302671 ("SaskPower installed the $1.5 billion technology, along with other retrofits on its 672-MW coal-fired power plant, in hopes of extending its life for another 30 years."); Dan Gearino, *A Lifeline for a Coal Plant Gives Hope to a North Dakota Town. Others See It as a Boondoggle*, InsideClimate News (July 17, 2021), insideclimatenews.org/news/17072021/north-dakota-coal-energy-transition-jobs-carbon-capture (noting that a project to retrofit a coal plant that was set to retire "might help to write a playbook for how to save other coal-fired power plants"); See Nicholas Kusnetz, In a Bid to Save Its Coal Industry, Wyoming Has Become a Test Case for Carbon Capture, but Utilities are Balking at the Pricetag, InsideClimate News (May 29, 2020), insideclimatenews.org/news/29052022/coal-carbon-capture-wyoming ("In 2020, [Wyoming] Gov. Mark Gordon signed a law—the first in the nation—that requires electrical utilities to generate some of their power from coal plants fitted with carbon capture equipment.").
[48] See U.S. Dep't of Energy, Office of Fossil Energy and Carbon Management, *Enhanced Oil Recovery*, www.energy.gov/fecm/science-innovation/oil-gas-research/enhanced-oil-recovery (last visited Oct. 13, 2022); IEA, *Storing CO2 through Enhanced Oil Recovery: Combining EOR with CO2 storage (EOR+) for profit* (2015), at 9-15 (explaining tertiary recovery), iea.blob.core.windows.net/assets/bf99f0f1-f4e2-43d8-b123-309c1af66555/Storing_CO2_through_Enhanced_Oil_Recovery.pdf.

Finally, carbon capture may be directly applied to fossil fuel production itself – but doing so does nothing to reduce the emissions generated when the fossil fuel produced is burned as intended. The most successful carbon capture projects to date have been applied to gas processing, to remove naturally-occurring carbon dioxide from drilled fossil gas, not post-combustion capture as when applied to coal- or gas-fired power plants.[49] Extending investment protection to any new fossil fuel project that utilizes carbon capture technology is not consistent with climate action. As IEEFA explains, "As gas processing CCUS is largely about 'capturing excess CO_2', it is obvious that CCUS in the sector is not about reducing Scope 3 emissions from the final combustion/use of gas. Rather it is about minimising production-related Scope 1 emissions from gas with excessive CO_2 content."[50]

In sum, no amount of investment in carbon capture can accelerate the phaseout of fossil fuels. CCS prolongs the operation of the polluting process or facility to which it is attached, thereby extending the use of fossil fuels rather than ushering in their replacement. What's more, it does not eliminate fossil fuels' planet-warming pollution, as proponents claim. Instead, it serves to greenwash, allowing industry to claim ongoing or expanded oil and gas production and use is compatible with climate goals, despite the clear scientific evidence to the contrary.

Risks of CCS

Beyond the issues inherent in deploying CCS as a climate solution, enshrining protections for CCS in the ECT will make the necessary regulation of CCS more challenging. CCS presents significant risks of harm at the capture, transportation, and storage stages. To the degree that CCS is deployed, all three of these areas will need to be well-regulated, and in many countries, the regulatory frameworks for CCS are far from complete.

Carbon capture units consume enormous amounts of energy, leading to potentially significant emissions of air pollutants at the capture site, such as fine particulate matter, that are not captured with the CO_2.[51] Were regulations to evolve to require additional pollution abatement and consistent public health and environmental protection that could increase the cost of operating carbon capture units significantly or even require them to stop operating if they were unable to meet pollution control requirements.

There are also safety and liability-related issues related to the transport, injection, and storage of CO_2 that regulations must address. Pipelines are required to move carbon dioxide from where it is captured to its ultimate destination. Because CO_2 must be condensed under high pressure for

[49] IEEFA, The Carbon Capture Crux, at 15-35.
[50] IEEFA, The Carbon Capture Crux, at 32-33.
[51] European Environment Agency, *CCS could also impact air pollution* (last modified November 23, 2020), www.eea.europa.eu/highlights/carbon-capture-and-storage-could. Though this report describes CCS positively, it should be noted that the pollution benefits come from installing better control technology on coal plants, not from carbon capture equipment itself. For examples of industry actors describing the pollution impacts of carbon capture, see, e.g., U.S. EPA, Archive Document: "PSD Greenhouse Gas Permit Application", at 11 (March 19, 2012), archive.epa.gov/region6/6pd/air/pd-r/ghg/web/pdf/chevron_response031912.pdf.

transport by pipeline, the risks of leakage and rupture are significant, and the consequences for affected populations could be severe. CO_2 is an asphyxiant that can be fatal at high concentrations.[52] The requirements for carbon dioxide pipelines could include design standards for the pipes themselves as well as siting requirements such as setbacks from population centers.

Finally, carbon dioxide storage also poses risks to people and the environment. Improperly managed injection could induce seismicity, causing leakage and contaminating groundwater,[53] as well as produce contaminated fluids (such as brines displaced underground)[54] that themselves require disposal. Where regulations do not yet exist or do not comprehensively address these issues, extending ECT protections to CCUS could discourage their adoption or amendment in the future or threaten to make the State bear the costs of taking regulatory action.

Hydrogen and Ammonia

Hydrogen and ammonia are produced almost entirely from fossil fuels, chiefly fossil gas. Protecting investments in hydrogen and ammonia would risk protecting the fossil gas extraction and production on which they depend.

Hydrogen *can* be produced from electrolyzed water, but it rarely is.[55] Nearly all (over 99%) hydrogen produced today is fossil in origin, produced primarily through the steam reformation of fossil fuels.

Although fossil-based hydrogen with CCS, dubbed "blue hydrogen," is encompassed in definitions of "low-carbon hydrogen," research shows that in practice, because of the significant impact of methane emissions, blue hydrogen is even more climate-destructive than fossil fuels used directly. When upstream emissions are considered, "the greenhouse gas footprint of blue hydrogen is more than 20% greater than burning natural gas or coal for heat and some 60% greater than burning diesel oil for heat," making clear that the technology is not "green."[56]

Accurately monitoring, reporting, and verifying the lifecycle emissions intensity of hydrogen (or gas, for that matter) is challenging, and calculations are susceptible to manipulation or misrepresentation. It is far from clear how compliance with an emissions-intensity standard will be verified to determine an investment's eligibility for ECT coverage or at what point such verification

[52] See U.S. EPA, *Appendix B: Overview of acute health effects associated with carbon dioxide* (2015), www.epa.gov/sites/default/files/2015-06/documents/co2appendixb.pdf.
[53] See, e.g., Thomas A. Buscheck et al, *Pre-Injection Brine Production for Managing Pressure in Compartmentalized CO2 Storage Reservoirs*, 63 Energy Procedia 5333, 5333 (2014), reader.elsevier.com/reader/sd/pii; see also Ernesto Santibanez-Borda et al., *Maximising the Dynamic CO2 storage Capacity through the Optimisation of CO 2 Injection and Brine Production Rates*, Int'l J. of Greenhouse Gas Control 80 (2019), 76-95, at 76, reader.elsevier.com/reader/sd/pii/S1.
[54] Steven T. Anderson and Hossein Jahediesfanjani, *Estimating the net costs of brine production and disposal to expand pressure-limited dynamic capacity for basin-scale CO 2 storage in a saline formation*, International Journal of Greenhouse Gas Control 102 (2020) 103161, at 1 of PDF, www.sciencedirect.com/science/article/pii/S1750583620305867
[55] IEA, Global Hydrogen Review 2022, at 109 (noting that "water electrolysis made up ~0.03%" of global hydrogen production in 2020).
[56] Robert Howarth and Mark Jacobson, *How green is blue hydrogen?*, 9(10) Energy Science & Engineering 1676 (2021), onlinelibrary.wiley.com/doi/full/10.1002/ese3.956.

will be made. Wherever the cutoff is set, tethering investment protection to the emissions intensity of hydrogen is not only administratively cumbersome but also profoundly dangerous for the reasons outlined below.

Hydrogen and Ammonia Links to Fossil Fuels

As noted above, hydrogen and ammonia are intimately linked with fossil fuels because they are almost entirely made from fossil fuels. Approximately 80% of hydrogen is produced directly from fossil fuels, with almost all of the remaining 20% produced as a by-product of petrochemical production or oil refining (themselves fossil-fueled processes).[57] Less than 1% of the hydrogen produced is "low-emission hydrogen."[58]

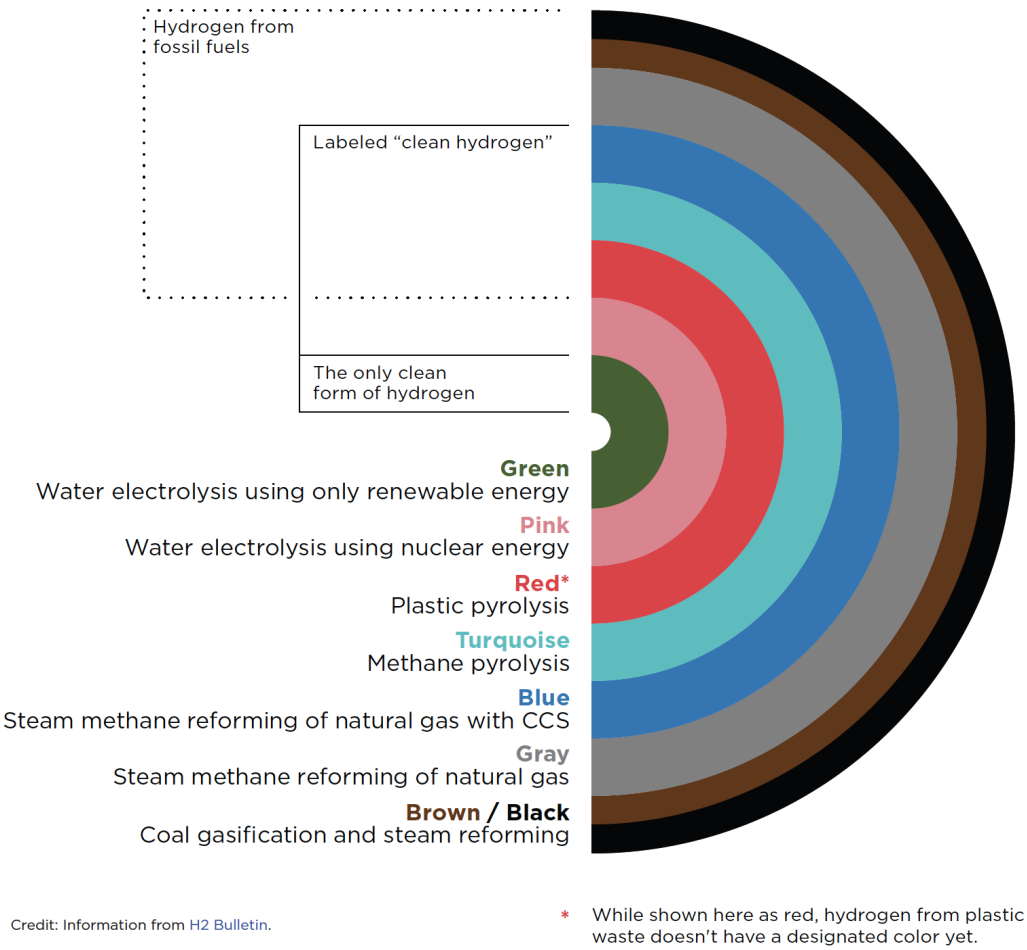
When directly produced from fossil fuels, hydrogen is typically produced from steam reformation of gas. Fossil gas or gasified coal is blasted with steam, producing hydrogen and carbon dioxide. Hydrogen made from coal is termed either "black" or "brown," and hydrogen made from fossil gas is termed "gray." "Blue" hydrogen is the industry term for hydrogen production from fossil fuels (typically fossil gas) to which carbon capture has been applied. [See Figure 1, Hydrogen Rainbow Spectrum.] Because gray hydrogen is both produced *from* fossil fuels (as the source of the hydrogen molecules) as well as *with* them (to power the production process), the upstream emissions from oil and gas drilling or coal mining represent a significant portion of the overall emissions from hydrogen production. Adding carbon capture equipment to hydrogen production not only fails to address this upstream source of emissions, it also exacerbates it, as the capture process requires additional energy and, therefore, additional fossil fuel production. This is particularly true of hydrogen produced from fossil gas.

"Green" hydrogen is hydrogen produced from electrolyzed water rather than from steam reformation of fossil fuels, using renewable energy to power the electrolysis. Truly green hydrogen, of which very little is produced today, is the only fossil-free form of hydrogen. Proposals to blend green hydrogen with fossil gas in the existing gas supply would effectively remove this distinction, as investments in such projects would necessarily be tethered to the fossil gas systems with which they are entwined. Even if there is a limited role for green hydrogen in the energy transition,[59] providing investors recourse to ISDS is not necessary to incentivize investment. Studies have cast doubt on the assumption that investment protection attracts investment, and a ranking by Bloomberg on the most attractive countries in the Global South for renewable energy

[57] IEA, *Global Hydrogen Review 2022*, at 20, iea.blob.core.windows.net/assets/c5bc75b1-9e4d-460d-9056-6e8e626a11c4/GlobalHydrogenReview2022.pdf.
[58] Jose M Bermudez, Stavroula Evangelopoulou and Francesco Pavan, IEA, *Hydrogen: More efforts needed* (2022), www.iea.org/reports/hydrogen.
[59] Debate remains about the need for green hydrogen and its limited applications. While replacing current industrial uses of fossil hydrogen with green hydrogen may make sense in some contexts, there is no basis for generating new demand for hydrogen as a fuel source, and no role for green hydrogen in sectors that can be electrified. Because of the inefficiency of converting renewable energy into hydrogen, "[i]t will always be more cost effective to use renewable energy directly from the grid than to use green hydrogen." Earthjustice, *Reclaiming Hydrogen for a Renewable Future: Distinguishing Oil & Gas Industry Spin from Zero-Emission Solutions* (2022), at 32, earthjustice.org/features/green-hydrogen-renewable-zero-emission.

investments did not even include the existence of investment treaties or ISDS provisions among the 167 indicators evaluated.[60]

Figure 1 Hydrogen Rainbow Spectrum



Ammonia is linked to fossil fuels because it is directly made from hydrogen. To make ammonia, hydrogen is combined with nitrogen (separated from other components of air) and subjected to heat and pressure in what is known as the Haber-Bosch process.[61] Unlike hydrogen, ammonia is stable as a liquid at much higher temperatures and much lower pressures and is, therefore, much

[60] See CAN Europe, *Do Not Resuscitate* (2022), at 6 (discussing Bloomberg NEF, Which market is the most attractive for energy transition investment?, global-climatescope.org/, and Joachim Pohl, OECD Working Papers on International Investment 2018/01, *Societal Benefits and Costs of International Investment Agreements: A critical reeview of aspects of and available empirical evidence* (2018), read.oecd-ilibrary.org/finance-and-investment/societal-benefits-and-costs-of-international-investment-agreements_e5f85c3d-en#page1.

[61] The Royal Society, *Ammonia: zero-carbon fertiliser, fuel and energy store*, at 4-5.

easier to condense, transport, and store. Ammonia is, therefore, sometimes referred to as a "hydrogen carrier."[62]

Protecting hydrogen and ammonia production threatens to exacerbate climate change and derail the energy transition. Green hydrogen and ammonia will have a small but real role to play in powering some processes that are not easily electrified or otherwise decarbonized. But for all the hype, blue hydrogen has, in practice, been worse for the climate than even fossil gas and coal, and building out a system of blue hydrogen as a putative bridge to green hydrogen is likely to end up counterproductive from a climate perspective. Moreover, if blue hydrogen and ammonia are truly meant to be a "bridge," there must necessarily be a point where they themselves are phased out — a prospect made ever more challenging by enshrining them in the protection of the ECT.

Risks of Hydrogen and Ammonia

Both hydrogen and ammonia present great risks and hazards, and neither is used for energy or fuel at a large scale. Large systems for storing, transporting, and using hydrogen and ammonia will require new regulations to protect the environment as well as public health and safety.

Hydrogen is a difficult chemical to manage. It is explosive — even upon contact with ambient air, for example[63] — and difficult to transport.[64] Moreover, hydrogen produces nitrogen oxides when burned, creating toxic risks if hydrogen is used either in industrial applications or in domestic gas lines.[65] Finally, because it is such a small molecule, hydrogen presents a much greater risk of leaking from storage tanks, pipelines, and other forms of transportation and storage.[66]

Ammonia is even more limited in its potential applications due to its toxic risks. At moderate concentrations, ammonia causes irritation of the eyes, nose, and respiratory tract. At high concentrations, it is — as noted by The Fertilizer Institute — "[p]romptly lethal."[67] Exposure of any kind can be dangerous, as ammonia "may be fatal if inhaled, ingested or absorbed through skin."[68] Ammonia is also highly corrosive, adding additional complications to any fuel system in which it is used.[69] Finally, even when combusted as intended, ammonia can release toxic nitrogen oxides, as

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[62] See, e.g., IEA, *Global Hydrogen Review 2022*, at 140.
[63] See *Hydrogen*, *IPCS INCHEM* (Internationally Peer Reviewed Chemical Safety Information) (April 2014), inchem.org/documents/icsc/icsc/eics0001.htm.
[64] See Etienne Rivard, Michel Trudeau, and Karim Zaghib, *Hydrogen Storage for Mobility: A Review*, Materials 12, no. 12 (2019): 11 (in pdf version), www.ncbi.nlm.nih.gov/pmc/articles/PMC6630991/; Russell McCulley, *Hydrogen success must overcome transportation challenges*, Upstream (September 15, 2021), www.upstreamonline.com/hydrogen/hydrogen-success-must-overcome-transportation-challenges/2-1-1067911.
[65] See Alastair Lewis, *Optimising air quality co-benefits in a hydrogen economy: a case for hydrogen-specific standards for NOx emissions*, *Environmental Science: Atmospheres* (2021), pubs.rsc.org/en/content/articlepdf/2021/ea/d1ea00037c.
[66] See Zhiyuan Fan et al., *Hydrogen Leakage, A Potential Risk for the Hydrogen Economy* (2022), www.energypolicy.columbia.edu/sites/default/files/pictures/Hydrogen%20Leakage%20Regulations,%20designed,%207.21.22.pdf.
[67] The Fertilizer Institute, *Health Effects of Ammonia* (Washington DC: The Fertilizer Institute), at 10, www.tfi.org/sites/default/files/documents/HealthAmmoniaFINAL.pdf.
[68] "Ammonia (Compound)," PubChem, pubchem.ncbi.nlm.nih.gov/compound/Ammonia#section=Substance-of-Very-High-Concern-(SVHC) (last visited August 22, 2022).
[69] Julia Hansson, Selma Brynolf, Erik Fridell, and Mariliis Lehtveer, *The Potential Role of Ammonia as Marine Fuel—Based on Energy Systems Modeling and Multi-Criteria Decision Analysis*, Sustainability 12 (2020) mdpi.com/2071-1050/12/8/3265/pdf.

its constituent nitrogen is combined with oxygen in the air.[70] Ammonia-powered fuel cells, alternatively, are extremely undeveloped and are not likely to be widely commercially available for quite some time, if ever.[71]

Allowing investors in these products to sue States for compensation under ISDS if regulatory changes diminish their returns or deprive them of future earnings could chill the enactment or reform of regulations necessary to safeguard people and the environment, and to allocate the costs of monitoring, managing, and mitigating the impacts of these new energy products.

Synfuels and Methanol

Synthetic fuels sit at the intersection of CCS and hydrogen, as by definition, they are "fuels, which are synthesized from hydrogen and carbon streams."[72] Though it is conceivably possible that synthetic fuels could be derived from non-fossil sources of carbon and hydrogen, in practice, this is unlikely given the central role of fossil fuels in both the generation of carbon dioxide streams and the production of hydrogen. Protections for synfuels pose the same risk of protecting fossil fuels as do hydrogen and CCS, just one step further down in the supply chain.

Finally, methanol is similarly a fossil fuel product in another form. Used as both a chemical feedstock and an energy source, methanol is derived primarily from fossil gas and coal.[73] It is also one of the main industrial users of hydrogen.[74] Protections for methanol amount to protections for the fossil fuel supply from which it – and its hydrogen input – is derived.

[70] Hideaki Kobayashi, Akihiro Hayakawa, K.D. Kunkuma A. Somarathne, and Ekenechukwu C.Okafor, *Science and technology of ammonia combustion*, Proceedings of the Combustion Institute 37, no. 1 (2019), at 109–133, doi.org/10.1016/j.proci.2018.09.029.
[71] See Georgina Jeerh, Mengfei Zhang, and Shanwen Tao, R*ecent progress in ammonia fuel cells and their potential applications*, Journal of Materials Chemistry A 9 (2021), at 747, pubs.rsc.org/en/content/articlepdf/2021/ta/d0ta08810b.
[72] See leaked Reformed ECT, p.124, at www.bilaterals.org/IMG/pdf/reformed_ect_text.pdf.
[73] See IEA, *IEA Reports: Chemicals* (2022), www.iea.org/reports/chemicals (noting that China produces 57% of the world's methanol, much of it from coal); *see also About Methanol - How Methanol is Made*, Methanex, www.methanex.com/about-methanol/how-methanol-made (last visited October 10, 2022); Methanol Institute, *Presentation, Methanol Production*, www.methanol.org/wp-content/uploads/2016/06/MI-Combined-Slide-Deck-MDC-slides-Revised.pdf (last visited October 10, 2022).
[74] IEA, *Global Hydrogen Review 2022*, at 29, iea.blob.core.windows.net/assets/c5bc75b1-9e4d-460d-9056-6e8e626a11c4/GlobalHydrogenReview2022.pdf.

Conclusion

The agreement in principle for a "modernized" ECT remains a serious obstacle to limiting global warming to 1.5°C. The revised ECT will continue to protect fossil fuel investments for at least ten years in some States and indefinitely in others. The carve-outs from the Reformed ECT proposed by the EU, the UK, and Switzerland are not compatible with the Paris Agreement either. Moreover, the carve-outs introduced by the EU and the UK create massive loopholes that investors and ECT arbitration tribunals could abuse to extend protections to investments incompatible with net zero.[75]

In extending investment protection to additional technologies and energy products, including CCUS, hydrogen, and ammonia, the revised ECT risks entrenching the fossil fuel era and further delaying necessary and effective climate action. Because they are tethered to fossil fuel inputs and use, carbon capture, hydrogen, and ammonia prolong reliance on oil, gas, and coal rather than accelerate their necessary phase-out. The fossil fuel sector promotes carbon capture, hydrogen, and ammonia as key strategies for keeping fossil fuel use significant or growing. Rather than envisioning an electrified and circular economy with significantly reduced energy use, particularly in high-emitting countries, industry proposals for future energy use include massive amounts of carbon capture on emitting facilities as well as hydrogen and ammonia for electricity, heat, transportation, and industrial use. Despite lip service to the distinction between green and blue hydrogen, proposals either treat both as "clean" or claim fossil hydrogen is necessary as a "bridge fuel" to a renewable hydrogen future.

The regulatory response to these technologies and products is rapidly changing and must continue to do so as evidence of their adverse impacts and shortcomings mounts. Carbon capture, hydrogen, and ammonia, as well as other emerging technologies contemplated for coverage under the ECT, pose risks to health, safety, and the environment that remain un- or under-regulated at present. Cementing regimes in place or arming investors in these technologies with ISDS to challenge or deter regulation ties governments' hands to protect people and the planet.

The Contracting Parties to the ECT are presently debating at the national and regional levels whether to endorse the new Treaty in November 2022. Under a so-called silence procedure, if no Contracting Party breaks the silence, the text will be formally adopted at the Energy Charter Conference in November.[76] The weaknesses and risks posed by the modernized text, outlined in this briefing, should inform those discussions.

At the European Union level, heated discussions are ongoing about whether the sealed amendments are *enough* to meet EU climate objectives and, if not, whether the Member States

[75] See also E3G Briefing, *Is the ECT aligned with the Paris Agreement?* (September 2022), www.e3g.org/publications/new-energy-charter-treaty-will-keep-hindering-climate-action.
[76] See Communication from the Directorate-General for Trade of the European Commission (June 24, 2022), policy.trade.ec.europa.eu/news/agreement-principle-reached-modernised-energy-charter-treaty-2022-06-24_en.

should jointly leave the ECT. The Commission will need to formally launch a procedure for signature and conclusion of the agreement that will require the agreement of the Council as well as the consent of the European Parliament. As a French official confirmed in early October, a coordinated withdrawal of the EU from the ECT is still on the table.[77]

Indeed, several European States and the European Parliament have signaled a preference for leaving the Treaty altogether rather than approving the modernized text.[78] In June, just a few days before the agreement in principle was reached, Spain[79] called for the EU to exit the ECT due to climate concerns, and the Netherlands announced their wish to withdraw from the Treaty.[80] Since then, the Polish parliament voted by majority to exit the ECT,[81] and Spain began the process of withdrawing from the Energy Charter Treaty.[82] There is still time for Member States to carefully assess all options before November.

In light of the analysis provided in this briefing, and in view of other concerns regarding provisions in the modernized Treaty.[83]

- The Contracting Parties should not endorse these changes at the Energy Charter Conference in November 2022 and should ultimately withdraw from the ECT;[84] and
- The EU and its Member States, as well as the UK and Switzerland, should recognize that the carve-outs under the "flexibility mechanism" are not climate-compatible and vote against the modernization package as it has been agreed in June 2022 by the signatory parties, and ultimately withdraw from the ECT.

[77] See tweet from Deputy for the Loire Atlantique in France, twitter.com/laernoes/status/1577366789436096514.
[78] See Committee on International Trade, Report on the future of EU international investment policy (2021/2176(INI)) (25 May 2022), www.europarl.europa.eu/doceo/document/A-9-2022-0166_EN.pdf.
[79] See POLITICO, Spain demands EU leave energy treaty over climate concerns (June 21, 2022), www.politico.eu/article/spain-demands-eu-leave-energy-treaty-over-climate-concerns. Since (on October 2022), Spain began the process of withdrawing from the Energy Charter Treaty over climate concerns, see POLITICO, *Spain pulls out of energy treaty over climate concerns* (12 October 2022), www.politico.eu/article/spain-pulls-out-of-energy-treaty-over-climate-concerns/?utm_source=POLITICO.EU&utm_campaign=38960aea51-EMAIL_CAMPAIGN_2022_10_13_05_14&utm_medium=email&utm_term=0_10959edeb5-38960aea51-190854908.
[80] See tweet from Christine Teunissen, Member of the Second Chamber of the States-General of the Netherlands since 2021, twitter.com/Ct_teunissen/status/1539636217804775424
[81] See vote from the Polish Parliament (vote No. 39) of 6 of October 2022, sejm.gov.pl/Sejm9.nsf/agent.xsp?symbol=glosowania&NrKadencji=9&NrPosiedzenia=63&NrGlosowania=39
[82] See POLITICO, *Spain pulls out of energy treaty over climate concerns* (12 October 2022), www.politico.eu/article/spain-pulls-out-of-energy-treaty-over-climate-concerns/?utm_source=POLITICO.EU&utm_campaign=38960aea51-EMAIL_CAMPAIGN_2022_10_13_05_14&utm_medium=email&utm_term=0_10959edeb5-38960aea51-190854908.
[83] See IISD Report, *Modest Modernization or Massive Setback? An analysis of the Energy Charter Treaty agreement in principle* (August 2022), www.iisd.org/system/files/2022-07/energy-charter-treaty-agreement-analysis.pdf.
[84] For further information, see IISD, *Energy Charter Treaty Reform: Why withdrawal is an option, IISD Investment Treaty News* (June 2021), www.iisd.org/itn/en/2021/06/24/energy-charter-treaty-reform-why-withdrawal-is-an-option.

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Annex NI explanatory table: What the EU, UK, and Swiss Carve-outs Say, and What they Mean

SECTION	TEXT	EXPLANATION
Annex NI, Section B 1 (a) of the Reformed ECT	"In addition, the Energy Materials and Products and activities listed below are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT. [...] 1. In relation to investments made after 15 August 2023 in the European Union and its Member States which are Contracting Parties to this Treaty regarding: (a) 27.01 Coal; briquettes, ovoids and similar solid fuels manufactured from coal. 27.02 Lignite, whether or not agglomerated, excluding jet. 27.03 Peat (including peat litter), whether or not agglomerated. 27.04 Coke and semi-coke of coal, of lignite or of peat, whether or not agglomerated; retort carbon. 27.05 Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons. 27.06 Tar distilled from coal, from lignite or from peat, and other mineral tars, whether or not dehydrated or partially distilled, including reconstituted tars. 27.07 Oils and other products of the distillation of high temperature coal tar; similar products in which the weight of the aromatic constituents exceeds that of the nonaromatic constituents. 27.08 Pitch and pitch coke, obtained from coal tar or from other mineral tars. 27.09 Petroleum oils and oils obtained from bituminous minerals, crude. Ex 27.10 Petroleum oils and oils obtained from bituminous minerals, other than crude. 27.11 Petroleum gases and other gaseous hydrocarbons. 27.13 Petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous minerals. 27.14 Bitumen and asphalt, natural; bituminous or oil shale and tar sands; asphaltites and asphaltic rocks. 27.15 Bituminous mixtures based on natural asphalt, on natural bitumen, on petroleum bitumen, on mineral tar or on mineral tar pitch (for example, bituminous mastics, cut-backs). Electrical energy (27.16) produced from Energy Materials and Products under the	Coal, oil, gas, hydrogen, synfuel and CCUS investments made after 15 August 2023 in the EU will **not** be covered under the ECT **except for**: "low-carbon hydrogen" or "renewable hydrogen," both defined as hydrogen (whether produced from fossil fuel, biomass, or water, and with fossil fuel or renewable power) with lifecycle emissions below 3tCO2e/tH2; and "low-carbon fuel," defined as fuel made from fuels produced from non-renewable waste or waste processing gas, low-carbon hydrogen, or synthetic fuel produced from low-carbon hydrogen with 70% reduction in lifecycle emissions. **[NOTE:** The text does not specify the baseline or benchmark against which the 70% reduction in lifecycle emissions will be measured.**]**

	subheadings 27.01 to 27.15; 2804.10 Hydrogen, with the exception of low carbon hydrogen and renewable hydrogen, which remain within the scope of the definition of economic activity in the energy sector. Low carbon hydrogen means hydrogen produced from non-renewable sources, with significantly reduced full life-cycle emissions resulting in less than 3tCO2eq/tH2. Renewable hydrogen means hydrogen produced from renewable sources, with the exception of biomass, resulting in full life-cycle emissions of less than 3tCO2eq/tH2. Synthetic fuels other than low carbon fuels. Low-carbon fuels mean recycled carbon fuels, low-carbon hydrogen and synthetic gaseous and liquid fuels produced from low-carbon hydrogen, which meet a 70% reduction in full life-cycle emissions. Recycled carbon-fuels mean liquid and gaseous fuels that are produced from liquid or solid waste of non-renewable origin or from waste processing gas and exhaust gas of non-renewable origin. And Economic activities concerning the capture, utilisation and storage of carbon dioxide."	
Annex NI, Section B 1 (b) of the Reformed ECT	"In addition, the Energy Materials and Products and activities listed below are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT. [...] (b) Notwithstanding subparagraph (a) Electrical energy (27.16) produced from petroleum gases and other gaseous hydrocarbons (27.11), through power plants and infrastructure enabling the use of renewable and low-carbon gases, and emitting less than 380 g of CO2 of fossil fuel origin per kWh of electricity, after 31 December 2030. Electrical energy (27.16) produced from petroleum gases and other gaseous hydrocarbons (27.11), through power plants and infrastructure enabling the use of renewable and low-carbon gases, and emitting less than 380 g of CO2 of fossil fuel origin per kWh of electricity related to investments that replace existing investments producing Electrical energy (27.16) from Energy Materials and Products under the subheadings 27.01 to 27.10, ten years after the date of entry into force of the changes in Section B of this annex approved on 22 November 2022 but no later than 31 December 2040. Transport, transmission, distribution of petroleum gases and other gaseous hydrocarbons (27.11) through pipelines made after the date of entry into force of the changes to this annex approved on 22 November 2022, provided that the pipelines are able to transport safe and sustainable renewable and low-carbon gases, including hydrogen shall be excluded from the definition of "Economic Activity in the Energy Sector" [ten] years after the date of entry into force of the changes in Section B of this annex approved on 22 November 2022 but no later than 31 December 2040."	The EU will extend protection to investments in gas-fired power generation through power plants and infrastructure "enabling the use of renewable and low-carbon gases" that emit less than 380 g of CO2 of fossil fuel origin per kWh of electricity, through 2030. Where such investments replace coal-fired power plants, the EU will extend protection for ten years after the agreement enters into force, or as late as the end of 2040. The EU will extend protection to investments in gas pipelines made after the entry into force of this agreement, if they are able to transport "safe and sustainable renewable and low-carbon gases, including hydrogen" through ten years after the agreement enters into force, or as late as the end of 2040. **[NOTE:** The text does not specify that the covered facilities actually use or transport renewable or low-carbon gases, just that they be capable of doing so.**]**
Annex NI, Section B 2 of the Reformed ECT	"In addition, the Energy Materials and Products and activities listed below are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT. [...] 2. In relation to investments made after 15 August 2023 in Switzerland regarding:	Switzerland excludes protection for investments made after 15 August 2023 in hydrogen, **except** for investments in "low carbon hydrogen" or "renewable hydrogen" defined as hydrogen resulting in less than 3 t CO2e/ton H2.

	2804.10 Hydrogen, with the exception of low carbon hydrogen and renewable hydrogen, which remain within the scope of the definition of economic activity in the energy sector. Low carbon hydrogen means fossil-based hydrogen and electricity based hydrogen, with significantly reduced full life-cycle of greenhouse gas emissions resulting in less than 3 t CO2 eq / t H2. Renewable hydrogen means hydrogen produced from renewable sources resulting in lifecycle greenhouse gas emissions of less than 3 t CO2 eq / t H2 And Synthetic fuels without significantly reduced life cycle greenhouse gas emissions compared to synthetic fuels produced from fossil fuels with no emissions abatement. Significantly is to be understood as achieving a threshold of 70% or higher."	Switzerland excludes protection for investments made after 15 August 2023 in synthetic fuels **except** for those with 70% fewer lifecycle GHG emissions than fossil fuel-based synthetic fuels without any "emissions abatement" [i.e. CCS].
Annex NI, Section B 3 of the Reformed ECT	"In addition, the Energy Materials and Products and activities listed below are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT. [...] In relation to investments made after 15 August 2023 in the United Kingdom regarding: (i) Energy Materials and Products in Annex EM I under subheadings 27.01 to 27.15, and electrical energy (subheading 27.16) produced from those Energy Materials and Products. (ii) 2804.10 Hydrogen with the exception of low-carbon hydrogen which remains in scope of the definition of Economic Activity in the Energy Sector. Low-carbon hydrogen means: 1. fossil-based hydrogen with carbon capture and storage; 2. electricity-based hydrogen; or 3. hydrogen produced from other production methods; which meets the United Kingdom's Low Carbon Hydrogen Standard as published when the investment is made. The previous subparagraphs (i) and (ii) do not apply to the following Energy Materials and Products which remain included in scope of the definition of Economic Activity in the Energy Sector: (i) Electrical energy (subheading 27.16 of Annex EM I) produced from petroleum gases and other gaseous hydrocarbons (subheading 27.11 of Annex EM I) through power plants and infrastructure using carbon capture and storage, where life-cycle greenhouse gas emissions are significantly reduced. (ii) Transport, transmission, and distribution of petroleum gases and other gaseous hydrocarbons (subheading 27.11 of Annex EM I) through pipelines provided the pipelines are capable of transporting renewable and low carbon gases."	The UK excludes coverage for fossil fuel investments made after 15 August 2023 **except** for: -"low-carbon hydrogen" which is any hydrogen (fossil-based or not) that meets the UK's Low Carbon Hydrogen Standard; -any electricity generated from gas-fired power plants and infrastructure that use CCS where lifecycle GHG emissions are "significantly reduced" **[NOTE:** "Significantly" is not defined in the text.**]** Transport, transmission, and distribution of gases through pipelines *capable of* transporting renewable and low carbon gases. **[NOTE**: The text does not specify that the covered pipelines actually transport renewable or low-carbon gases, just that they are capable of doing so.**]**
Annex NI, Section B [chapeau] of the Reformed	"In addition, the Energy Materials and Products and activities listed below are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT. Until the entry into force of the amendments to the Energy Charter Treaty approved	These clauses pertain to reciprocity. Under (i) Parties listed in Annex NPT do not provide investment protection to investments in their jurisdictions in energy

ECT	on 22 November 2022: (i) Part III of the ECT does not apply to a Contracting Party listed in Annex NPT in respect of an Investment in their Area by an Investor of another Contracting Party regarding Energy Materials and Products, or activities excluded by the latter Contracting Party in Section B of Annex NI (ii) A [Contracting] Party listed in Annex IA-NI does not give the unconditional consent of Article 26(3)(a) to Investments of an Investor of another Contracting Party related to Energy Material and Products, or activities excluded by that other the latter Contracting Party in Section B of Annex NI."	activities, materials or products that the investor's home country excludes from ECT coverage. Parties currently listed under Annex NPT include Japan. Under (ii) Parties listed in Annex IA-NI do not allow ISDS claims against themselves for investments in energy activities, materials or products that the investor's home country excludes from ECT coverage. Parties currently listed under Annex IA-NI include Switzerland and Turkey.
Annex NI, Section C 1 of the Reformed ECT	"In addition, the following Energy Materials and Products and activities are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT: 1. In relation to Investments made before 15 August 2023 in the European Union and its Member States which are Contracting Parties to this Treaty regarding Energy Materials and Products as well as activities listed in paragraph 1(a) of Section B to this Annex: [ten] years after the date of entry into force of the changes in Section C of this annex approved on 22 November 2022 but no later than 31 December 2040."	With regard to existing investments and those made before 15 August 2023 in fossil fuels excluded from coverage thereafter, the EU will extend investment protection for 10 years after the entry into force of the agreement, or as late as the end of 2040.
Annex NI, Section C 2 of the Reformed ECT	"In addition, the following Energy Materials and Products and activities are excluded from the definition of Economic Activity in the Energy Sector only in relation to provisions contained in Part III of the ECT: 2. In relation to Investments made before 15 August 2023 in the United Kingdom regarding: (i) Energy Materials and Products in Annex EM I under subheadings 27.01 to 27.04, and electrical energy (subheading 27.16) produced from those Energy Materials and Products: After 01 October 2024 or the date of entry into force of the changes in this Section if later. (ii) Energy Materials and Products in Annex EM I under subheadings 27.05 to 27.15, and electrical energy (subheading 27.16) produced from those Energy Materials and Products: 10 years after the date of entry into force of the changes in Section C of this annex approved on 22 November 2022. The previous subparagraphs (i) and (ii) do not apply to the following Energy Materials and Products which remain included in scope of the definition of Economic Activity in the Energy Sector: (iii) Electrical energy (subheading 27.16 of Annex EM I) produced from petroleum gases and other gaseous hydrocarbons (subheading 27.11 of Annex EM I) through power plants and infrastructure using carbon capture and storage, where life-cycle greenhouse gas emissions are significantly reduced. (iv) Transport, transmission, and distribution of petroleum gases and other gaseous hydrocarbons (subheading 27.11 of Annex EM I) through pipelines provided the pipelines are capable of transporting renewable and low carbon gases."	With regard to existing investments and those made before 15 August 2023 in fossil fuels excluded from coverage thereafter, the UK will extend investment protection to coal investments until 1 October 2024; and to oil and gas-based power for 10 years after the entry into force of the agreement; But investments in gas power plants and infrastructure with CCS that "significantly" reduces lifecycle emissions and investments in pipelines capable of transporting renewable and low carbon gases are protected indefinitely. **[NOTE:** "Significantly" is not defined in the text.**]**