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Brief Report

Emissions intensity: do we need a CBAM for oil and gas imports?

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ABSTRACT

The UK has seen significant recent attention being paid to the issue of the 'emissions intensity' of oil and gas operations, with the oil and gas industry and the Government using this as a climate justification for domestic North Sea production over imported oil and gas. This commentary explores these arguments in the context of the Rosebank decision and examines why emission intensity matters for lawyers. One key reason identified involves trade: without a carbon border adjustment mechanism (tax) or equivalent on imports of oil and gas from countries with poor records on electrification, flaring and vented emissions, domestic oil and gas production faces unfair climate competition.

INTRODUCTION

In its updated 2023 Net Zero Roadmap, the International Energy Agency (IEA) makes it clear that to keep the Paris Agreement 1.5°C temperature goal in reach, there needs to be a significant increase in renewables, with an accompanying 80 per cent drop in demand for fossil fuels by 2050.[1] This means a corresponding decrease in the supply of the latter, with no 'new' long-lead-time upstream oil and gas projects from 2023. However, while acknowledging that continued investment in some 'existing' oil and gas assets is necessary to ensure that oil and gas supply matches declining demand, the IEA also stresses the need to reduce the emissions from oil and gas operations in order to keep 1.5°C alive.[2] Operational emissions from the production, transport, and processing of oil and gas represent around 15 per cent of total global energy-related greenhouse gas (GHG) emissions.[3] In 2022, these amounted to 5.1 billion tonnes (Gt) CO_2-eq.[4] The final consumer use of the oil and gas then forms a further 40 per cent of emissions.[5]

Thus, while scope 3 emissions from the combustion of oil and gas by consumers is the largest part of the problem for climate and energy law to tackle—via demand reduction[6] and supply-side[7]

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1 IEA, *Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach 2023 Update* (2023).
2 IEA, *Emissions from Oil and Gas Operations in Net Zero Transitions: A World Energy Outlook Special Report on the Oil and Gas Industry and COP28* (2023).
3 ibid.
4 ibid.
5 ibid.
6 See eg via emission trading systems.
7 See eg Michael Lazarus and Harro van Asselt, 'Fossil Fuel Supply and Climate Policy: Exploring the Road Less Taken (2018) 150 Clim Change 1; Chris Hilson, 'Masterplots of Demand and Supply and the Energy Trilemma: Delaying the Transition', <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4556949> accessed 8 November 2023.

measures—in the meantime it also remains very important to bear down on operational scope 1 and 2 emissions. This is a matter of 'emissions intensity'. Emissions intensity calculates emissions per a relevant unit of measure.[8] In the case of the oil and gas sector, emissions intensity may for example involve a measure of the GHG emissions associated with the production of each barrel of oil equivalent (boe).[9]

The focus of this commentary is on this issue of emissions intensity. The next section uses the September 2023 UK North Sea Rosebank decision, and the November King's speech announcement of annual licensing rounds for oil and gas, to provide a country case example of how emissions intensity has become a live political issue in defending new sources of domestic oil and gas production. The following section then highlights the need for a Carbon Border Adjustment Mechanism (CBAM), or an equivalent imports-correcting measure, if emissions intensity is to be taken seriously. Without it, high-standard countries that do bear down on issues like gas flaring, venting and electrification of drilling platform power, are in danger of losing out to states where these operational activities remain poorly regulated. The conclusion draws together why lawyers should be interested in emissions intensity, including but not limited to this trade-related CBAM element.

ROSEBANK AND UK NORTH SEA LICENSING

The UK has heard a lot in recent months about the supposed emissions intensity advantages of home-produced oil and gas over imports. Claims about this accompanied both November's announcement of new annual licensing rounds for oil and gas production, and September's decision to give the go-ahead to the new Rosebank oil and gas field in the North Sea. Welcoming the former, Orcadian Energy plc argued that it supported a need to 'refresh the global oil supply with low emission barrels'.[10] In defending the latter (Rosebank), Energy Security and Net Zero Secretary Claire Coutinho claimed that 'overall it means lower emissions'.[11] The Government press release similarly stated that 'the carbon footprint of domestically producing UK gas is … around one-quarter of the carbon footprint of importing internationally produced liquified natural gas'.[12]

The UK's independent climate change watchdog, the Climate Change Committee (CCC), has looked into such claims. It questions whether these scope 1 and 2 GHG reductions in the production, transport, and processing stages make up for the fact that new oil fields like Rosebank will be adding more oil and gas onto the global market overall and therefore more scope 3 emissions.[13] With that caveat aside, the CCC has nevertheless observed that 'there may be emissions advantages to UK production replacing imports'.[14] As things stood in 2022, the CCC calculated that UK production has a 14 per cent lower emissions intensity than international imports for gas and 3 per cent lower for oil.[15] Equinor, the Norwegian developer of Rosebank, is planning to electrify production, although that will not be until at least 3 years after the expected production start date of 2026–27[16] because, on Equinor's own admission, the technology is not yet 'qualified and

[8] GHG Protocol, Technical Guidance for Calculating Scope 3 Emissions, Appendix C: Calculating emissions intensity metrics, <https://ghgprotocol.org/sites/default/files/2022-12/AppendixC.pdf> accessed 8 November 2023.

[9] North Sea Transition Authority, *Emissions Monitoring Report 2022* (2022). As this report makes clear (p 32), 'emissions intensity' is typically more inclusive in including all GHG, notably methane, and not just CO_2 (more associated with the term 'carbon intensity').

[10] Orcadian Energy, 'Annual Licensing Rounds', RNS, 7 November, <https://www.investegate.co.uk/announcement/rns/orcadian-energy–orca/annual-licensing-rounds/7864761> accessed 8 November 2023.

[11] James FitzGerald and Heather Sharp, 'Sunak Hails Rosebank Oil Approval in Face of Climate Outcry' *BBC News* (London, 27 September 2023) <www.bbc.co.uk/news/live/uk-66933804> accessed 8 November 2023.

[12] Department for Energy Security and Net Zero, 'Government Backs New Oil and Gas to Safeguard UK and Grow the Economy', press release (27 September 2023) <www.gov.uk/government/news/government-backs-new-oil-and-gas-to-safeguard-uk-and-grow-the-economy> accessed 8 November 2023.

[13] CCC, 'Climate Compatibility of New Oil and Gas Fields', letter (24 February 2022) <www.theccc.org.uk/publication/letter-climate-compatibility-of-new-oil-and-gas-fields/> accessed 8 November 2023.

[14] ibid.

[15] ibid.

[16] Sarah Young, 'Britain Gives Go-Ahead for Biggest New North Sea Oilfield in Years' *Reuters* (London, 27 September 2023) <www.reuters.com/business/energy/uks-rosebank-oil-field-development-gets-go-ahead-2023-09-27/> accessed 8 November 2023.

matured' and regulatory consents will also be needed.[17] With electrification, those CCC figures will come down further. The energy consultancy Wood Mackenzie estimates that imports will in due course have five times the level of production and transport-related GHG emissions than from electrified Rosebank and Cambo fields.[18] Equinor's own figures show an intensity of 12 kg CO_2/boe using gas turbines for the development and 3 kg CO_2/boe with full electrification.[19]

Import sources matter for comparison though, as does the relative balance between oil and gas. Rosebank will be producing mostly oil, with a small percentage of gas. Much of Rosebank's oil is likely to be refined abroad and its overall carbon intensity, if re-imported as refined oil into the UK, will be greater than crude oil imported from Norway and refined here. And that matters because Norway is currently the UK's main source of crude oil imports.[20] Electrification of Rosebank's field production would, admittedly, bring those oil intensity levels much closer. The small amount of gas from Rosebank will most likely be piped into the UK gas network. However, again, piped gas from Norway is the UK's current main source of fossil gas, and emissions intensity there is already very low. Overall, then, one needs to be careful in arguing that Rosebank offers distinct advantages in terms of emissions intensity when compared to imported oil and gas. If one takes the proportion of oil imported from places like Nigeria and the Middle East, then yes, Rosebank—particularly if electrified—compares extremely well on carbon intensity of production, transport, and processing, as it does against liquified natural gas (LNG) from countries like Qatar and the USA. And if one takes all imports together, from all countries, then there are, again, some key environmental advantages to home production. But if one looks at imports from Norway, the UK's current main source of imports for crude oil and gas, then Rosebank no longer really outperforms on the carbon intensity front.[21]

THE EMISSIONS INTENSITY CASE FOR CBAM

Although it is therefore important not to overstate them—and to choose the appropriate comparator—there may nevertheless be emissions intensity and thus climate benefits of domestic production of oil and gas over imports, especially from countries with laxer production standards. If governments want to take emissions intensity seriously, however, they need to be doing much more than asserting the benefits of domestic oil and gas production in countries like the UK. What they need is a carbon border, CBAM-type, tax on imports of oil and gas that reflects the carbon intensity of production, transportation and processing, or something equivalent to a CBAM that will level the playing field for imports. That carbon intensity is particularly bad in countries that rely on routine (non-emergency) gas flaring during production, and where there are significant vented and fugitive emissions of methane—an extremely powerful GHG. Nigerian oil production for example, has failed to put effective controls in place to prevent routine flaring. This not only wastes the gas, burning it without it being used for anything, but it has also harmed local communities.[22] Globally, flaring contributes 1.5 times as many carbon emissions as airlines.[23] And the flaring intensity of Europe's domestic oil production is said to be 82 per cent lower than imported oil.[24] As for uncaptured methane released into the atmosphere, US fracking operations are a major source of

[17] Rosebank Environmental Statement ES/2022/001 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1097880/Rosebank_Environmental_Statement_-_Final_for_Submission_To_OPRED_Equinor_3rd_August_2022.pdf> accessed 8 November 2023.

[18] Wood Mackenzie, 'Rosebank and Cambo Fields Barometer for the Future of the North Sea', news release (26 June 2023) <www.woodmac.com/press-releases/rosebank-and-cambo/> accessed 8 November 2023.

[19] Rosebank Environmental Statement (n 17).

[20] ONS, 'Trends in UK Imports and Exports of Fuels' (29 June 2022) <www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/articles/trendsinukimportsandexportsoffuels/2022-06-29> accessed 8 November 2023.

[21] Caroline Lucas, Green MP, Hansard, HC 735 (Westminster Hall) Debate, *Rosebank Oilfield: Environmental Impacts*, 28 June 2023 <https://hansard.parliament.uk/commons/2023-06-28/debates/BFB69676-9E1C-4899-876B-A80C34FD8450/RosebankOilfieldEnvironmentalImpacts> accessed 8 November 2023.

[22] Urenmisan Afinotan, 'How Serious is Nigeria About Climate Change Mitigation Through Gas Flaring Regulation in the Niger Delta?' (2022) 24 Environ Law Rev 288.

[23] FlareIntel, 'How the EU's CBAM will Impact Energy Imports from Countries that Flare Gas', 23 September 2021 <https://flareintel.com/insights/how-the-eus-cbam-will-impact-energy-imports-from-countries-that-flare-gas> accessed 8 November 2023.

[24] ibid.

emissions.[25] One 2019 study suggested that North American shale-gas production may have contributed over half of all the increased global emissions from fossil fuels in the past decade.[26]

To allow this dirty oil and gas to be imported into countries with cleaner domestic oil and gas production does no favours to that home industry, because it allows it a free carbon pass. That is unfair climate competition: producers from higher standard states like the UK and Norway lose out to producers from states with lower climate standards on oil and gas production (whether that be on electrification, flaring, or uncaptured methane emissions). Oil and gas are of course themselves dirty fossil fuels, but some fuels are clearly a lot dirtier than others because of the relative climate friendliness of their operational processes. For that reason, some have argued that there needs to be a CBAM in place for oil and gas imports,[27] just as the EU is introducing for sectors like steel, cement, hydrogen, and electricity,[28] and which the UK, in its current consultation,[29] is considering for its own list of sectors. Although the proposed UK list includes refining, neither the EU nor UK CBAM lists include the extraction of oil or gas as a sector. One of the justifications for those currently included CBAM sectors is that they typically apply where there is a risk of 'carbon leakage' (losing industry abroad), especially as the EU and UK gradually unwind their free allowances for the relevant sectors under the respective EU[30] and UK[31] emissions trading systems (ETS).[32] If those sectors are paying a high carbon price which non-EU or -UK companies are not, then that is unfair climate competition, and carbon leakage may be a risk. Oil and gas is not itself an explicitly listed sector within the EU or UK ETS, although refineries are covered, and offshore gas-fired or diesel power production to run upstream operations is within scope, as is gas flaring, if the total combustion levels are large enough.[33] The UK ETS essentially mirrors the EU's on free allocation,[34] and in both, emissions from offshore power production and combustion flaring only benefit from free ETS allowances for extraction of oil,[35] with the gas sector not regarded as at risk of carbon leakage.[36] There will therefore be a CBAM justification for oil as free allowances are eventually removed. However, one might also argue a case for a CBAM across both oil and gas, not because they are paying an ETS carbon price that imports are not facing, but because renewables electrification of offshore platforms[37] itself comes at a cost that importers who have not electrified will not have paid. In any event, as we have seen, unfair climate competition and the risk of carbon leakage (here of the home oil and gas industry moving or losing out to operations abroad) goes beyond just platform power and flaring combustion emissions and electrification, and also includes vented and fugitive gas emissions.

[25] Adam Vaughan, 'Fracking Wells in the US are Leaking Loads of Planet-Warming Methane' *New Scientist* (22 April 2020) <www.newscientist.com/article/2241347-fracking-wells-in-the-us-are-leaking-loads-of-planet-warming-methane/> accessed 8 November 2023.

[26] Robert W Howarth, 'Ideas and Perspectives: Is Shale Gas a Major Driver of Recent Increase in Global Atmospheric Methane?' (2019) 16 Biogeosciences 3033.

[27] FlareIntel (n 23).

[28] Regulation (EU) 2023/956 of the European Parliament and of the Council establishing a carbon border adjustment mechanism [2023] OJ L130/52, as amended.

[29] Department for Energy Security and Net Zero and HM Treasury, 'Addressing Carbon Leakage Risk to Support Decarbonisation: A Consultation on Strategic Goals, Policy Options and Implementation Considerations' (March 2023) 28–29, 34. The Chancellor's November 2023 Autumn statement mentioned the consultation on a UK CBAM and stated that the government response would be published 'shortly'.

[30] Directive 2003/87/EC establishing a system for GHG emission allowance trading within the Union [2003] OJ L275/32.

[31] The Greenhouse Gas Emissions Trading Scheme Order 2020, SI 2020 No 1265.

[32] See <https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en#key-elements> accessed 8 November 2023. Free allocation is the existing carbon leakage measure but is obviously suboptimal because it reduces the incentive to cut emissions.

[33] See Annex 1 of Directive 2003/87/EC (n 28); see further eg CMS, 'EU ETS and Oil and Gas Acquisitions' 22 February 2008 <https://cms-lawnow.com/en/ealerts/2008/02/eu-ets-and-oil-and-gas-acquisitions> accessed 8 November 2023. On combustion flaring's inclusion, see eg BEIS, European Union Emissions Trading Scheme (EU-ETS): Phase IV National Implementation Measures (NIMs) Baseline Data Collection & FAQs, Offshore Oil and Gas Industry Guidance' (May 2019). See also (onshore), Environment Agency, 'Onshore Oil and Gas Sector Guidance' (2020) [8.4], <www.gov.uk/guidance/onshore-oil-and-gas-sector-guidance/8-flares-at-onshore-oil-and-gas-sites> accessed 29 November 2023.

[34] See The Greenhouse Gas Emissions Trading Scheme (Amendment) Order 2020, SI 2020 No 1557, Sch 1.

[35] Including any 'associated' gas produced with it that is either reinjected or flared: BEIS (n 33) 6.

[36] Decision (EU) 2019/708 supplementing Directive 2003/87/EC of the European Parliament and of the Council concerning the determination of sectors and subsectors deemed at risk of carbon leakage for the period 2021–30 [2019] OJ L120/20 (see the Annex which lists only 'Extraction of crude petroleum' (oil) as benefiting from free allowances in the relevant period (and not gas). On the lack of carbon leakage risk justification for excluding fossil gas extraction, see recital 20.

[37] As planned for Rosebank. Elecrification will enable them to escape many of those ETS emissions payments.

Table 1. Offshore oil and gas extraction, ETS and CBAM

Offshore oil and gas extraction	In ETS?	In CBAM list?	Free ETS allowances?	Gas venting in ETS?
EU	Yes, for CO_2 from installations where the total of all combustion units (power generation and flaring) exceeds 20 megawatt thermal (MWth)	No	Yes, for extraction of oil (risk of carbon leakage) No, for gas (no risk of carbon leakage)	No, methane venting to be covered instead by new Methane Regulation
UK	Yes, as for EU	No	Currently as for the EU above Planned vented CO2 (see right column) will not attract free allowances Free allowances possibly for emergency methane venting only	Considering including uncaptured methane and vented CO_2 in UK ETS

Table 1 shows the above links, for the EU and UK oil and gas sector, between the relevant ETSs, CBAM measures, and free allocation of ETS allowances. It also reveals how EU and UK practice looks set to diverge in relation to those vented and fugitive gas emissions. The UK is considering bringing uncaptured gas emissions—aimed principally at methane but also including vented CO_2 'process'[38] emissions above a 1000 tonnes annual threshold—within the scope of the UK ETS.[39] If implemented, the oil and gas industry in the UK will, in the absence of free allowances,[40] be facing a carbon price for uncaptured methane emissions under the UK ETS, which many overseas producers will not be. There may therefore be a risk of carbon leakage and, if one exists, that provides a case for a CBAM. The EU, in contrast, under the provisional agreement reached in November 2023 between the European Parliament and Council on a new EU Regulation to reduce energy sector methane emissions,[41] has taken a different path. Instead of including all uncaptured gas emissions from oil and gas operations in the EU ETS, it has created a stand-alone law directed at methane. Under the new Regulation, the fossil gas, oil, and coal industry operating in the EU will be obliged to monitor, report, and verify their methane emissions and to take action to reduce them, including addressing leaks. Routine venting and flaring by the oil and gas sector is to be banned. Because this could create carbon leakage risks, from 2027 the Regulation will only allow new import contracts for oil, gas, and coal where the same monitoring, reporting, and verification obligations are applied by exporters. From 2030, new contracts will need to meet methane intensity standards using methodology set out in the Regulation.[42]

[38] UK Government and others, 'Developing the UK Emissions Trading Scheme: Main Response' (June 2023) 83: 'Process' emissions are ones associated with 'any process, via any means of technology, that removes carbon dioxide from the oil or gas, and then releases it to the atmosphere via either a vent or an unlit flare. This will not include any carbon dioxide that is emitted via an unlit flare that has not come through the carbon dioxide-stripping processes'. The relevant CO_2-stripping technology (also known as 'gas sweetening') include in the upstream oil and gas sector. These include 'amine units, glycol units, selexol processes, absorption units, acid gas removal units, membrane technology, and cryogenic methods'.

[39] ibid. There will be no free UK allowances for venting of CO_2, because the report considers that the policy is likely to produce a 'minimal financial impact on the sector' and because there is no anticipation of it leading to carbon leakage (83).

[40] Unlike vented CO_2, the free allowance position on vented and other forms of uncaptured methane (such as fugitive emissions) is less clear from the report (86–88). It leaves it yet to be decided whether emergency venting of methane may qualify for free allowances. It seems that non-emergency methane emissions would not attract free allowances (so as to maintain an economic incentive effect to drive them down).

[41] European Commission, Press Release, 'Commission Welcomes Deal on First-Ever EU Law to Curb Methane Emissions in the EU and Globally', 15 November 2023 <https://ec.europa.eu/commission/presscorner/detail/en/IP_23_5776> accessed 27 November 2023.

[42] ibid. See also Ian Johnston, 'EU Rules on Methane Leaks to Hit Oil and Gas Importers', FT (15 November 2023).

CONCLUSION

Emissions intensity of oil and gas operations matters for climate and energy law and has not received the attention that it deserves in the existing academic literature. Its legal relevance lies in a number of respects. First, lawyers and regulators need to be aware of the tools that can be used to tackle emissions intensity such as rules on methane leaks, flaring, venting, electrification and carbon capture usage and storage (CCUS) from oil and gas operations.[43] Second, they need to be conscious of the role of data reporting on operational emissions from oil and gas activities.[44] Without accurate reporting of methane leaks, vented emissions, and CO_2 emissions from flaring and drilling power plants, it will be impossible to regulate emissions and to establish how far emissions intensity is improving. Thirdly, as companies—both oil and gas companies and those using their fuels—begin to take their net zero commitments more seriously, we can expect producers to increasingly compete on emissions intensity.[45] But to allow that to happen effectively, you need a CBAM or equivalent in place for oil and gas imports. The EU is not going down the CBAM route and has opted instead for something equivalent. While its new methane Regulation also seeks to level the playing field for imports, albeit in a different way (via supply chain new contract obligations), it is less complete in its coverage. Not being methane related, platform power ETS emission costs, and electrification costs to move away from them, will not be shielded for EU operators once current free oil sector allowances are removed. For the UK, which has proposed to include uncaptured emissions within the UK ETS, a CBAM to combat carbon leakage, while not yet planned for the oil and gas sector, will make more sense. Fourthly, mention of net zero raises the issue of emissions intensity in oil and gas corporate net zero targets and reporting.[46] This has not been without controversy, because a reliance on reducing emissions intensity rather than reducing absolute emissions means that oil and gas companies are still able to increase their output of oil and gas. In that case, their scope 1 and 2 emissions may therefore be down, but scope 3 emissions will not be. And, as we have seen, those scope 3 emissions are still the larger element of the overall oil and gas industry footprint. Because of the growing importance of operational emissions to stakeholders, we can expect to see increasing litigation across many of the above points—alleging greenwashing around intensity claims for example, or challenging intensity-based corporate net zero targets.

Finally, some may object to the imposition of an oil and gas CBAM on climate and energy justice grounds. However, while justice is a topic that has rightly received increasing attention in the academic literature on energy law and policy,[47] the argument on CBAM is not straightforward in justice terms. Some may claim that it would unfairly penalize domestic producers in the Global South who cannot afford the technology needed to update their operational practices, and where oil and gas revenues may represent a significant proportion of GDP. However, on the other hand, one should not forget the justice claims of local communities in these countries who have, as adverted to earlier, often suffered significant negative health outcomes as a result of uncontrolled flaring.[48] A CBAM may well concentrate minds and galvanize effective action to protect those communities in a way that has, in the past, been too easy for some countries to avoid. And while the EU is not going down the CBAM route, its own equivalent—by banning routine flaring and venting for all, including imports—will give rise to very similar justice arguments.

[43] For a useful summary, see eg (n 2) and <https://www.iea.org/energy-system/fossil-fuels> accessed 8 November 2023.
[44] In the UK, see eg the role of emissions data in performance benchmarking and the Emissions Monitoring Dashboard: <www.nstauthority.co.uk/the-move-to-net-zero/net-zero-benchmarking-and-analysis/carbon-emissions-intensity-analysis/> accessed 8 November 2023. See also n 9.
[45] FlareIntel (n 23).
[46] See eg Simon Dietz and others, 'How Ambitious are Oil and Gas Companies' Climate Goals?' (2021) 374 Science 405.
[47] See eg Kirsten Jenkins and others, 'Energy Justice: A Conceptual Review' (2016) 11 Energy Res & Soc Sci 174; Thomas L Muinzer, 'Challenges in Research Approaches to the 'just energy transition' in Legal Studies and Other Branches of the Social Sciences' (2023) 16 J World Energy Law & Bus 8.
[48] Afinotan (n 22).