European Business Organization Law Review (2022) 23:313–346
https://doi.org/10.1007/s40804-022-00246-2

ARTICLE

Corporate Disclosures on Climate Change: An Empirical Analysis of FTSE All-Share British Fossil Fuel Producers

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Accepted: 28 March 2022 / Published online: 4 May 2022
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Abstract
Although UK company law has become more sensitive to climate change problems, many open questions and issues remain about the practical utility of disclosure as a presumptive regulatory solution. This article presents and analyses unique empirical research to explore if and to what extent FTSE All-Share British fossil fuel producers are clearly and reliably: (a) integrating into their overall business risk management the 'material' risks that climate change presents to their operations; and (b) reporting the impact of their business activities on the climate and the likely consequences of any business decisions in the long term. The results show that current disclosure regulation apparently fails to secure behavioural change on the part of most companies in our sample. The article offers several explanations that provide a possible answer with validity as to why disclosure does not achieve its organising purpose of managing the risks and impacts of climate change.

Keywords Company law · Companies · Disclosure · Climate change

1 Introduction

The indirect and cumulative impact of commercial activity and organisation on climate change portend not only an existential challenge to the planet,[1] but has evolved into a clear and material risk to companies, investors and the entire financial system.[2]

[1] The Intergovernmental Panel on Climate Change (IPCC) has published a special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, see United Nations Intergovernmental Panel on Climate Change (2018). For literature on the effects of commercial activity on climate change, see Wright and Nyberg (2015), p 3. See also Heede (2014), p 234; Hmiel et al. (2020), p 409.

[2] On the categorisation of these risks as physical risks, liability risks and risks associated with transition to a low-carbon economy, see Carney (2015).

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On this basis, over the past decade UK company law has become more sensitive to the objectives of the Paris Agreement to strengthen the global response to climate change.[3] Most obviously, the British government has sought to introduce climate risk and impact into broader financial risk analysis and disclosure rules. Typically this approach has led to prescriptions for yet more disclosure, simpler disclosure and investor stewardship.[4] The narrative is simple: a company's climate-related disclosures in its annual report and accounts are an effective means of communicating to shareholders both the potential impact of climate change on the future of the business and the company's impact on the environment, which should, in turn, produce a powerful restraining influence for corporate boards.[5] But in embracing disclosure as a basic policy choice, academic or practitioner opinion has failed to find a consensus narrative as to whether—or not—the intended legislative response can address and resolve the prior legal problem. Some have sought to depict disclosure regulation increasingly in public policy terms as a desirable corporate governance attribute, which is able not only to improve organisational performance and prospects, but also to support the transition to a low-carbon economy.[6] Others reject the suggestion that corporate boards are sufficiently incentivised to disclose accurate, relevant, clear and comparable climate-related risk or impact based on investor-led demand alone.[7] Something appears to be missing.

This is not an article that aims to add to existing dialogue on what we might *think* about the practical utility of disclosure within the UK's company law ruleset. Instead, it presents and analyses unique empirical research to explore if and to what extent British carbon-intensive companies are clearly and reliably: (a) integrating into their overall business risk management those 'material' risks that climate change presents to their operations;[8] and (b) reporting the impact of their business activities on the climate and the likely consequences of any business decisions in the long term.[9] To address these two critically important questions, the article first

[3] Paris Agreement FCCC/CP/2015/10/Add.1 (adopted 12 December 2015, entered into force 4 November 2016), Article 2(1), https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/FCCC_CP_2015_10_Add.1.pdf (accessed 21 March 2022).

[4] On this approach, see FRC (2019).

[5] Parkinson (2003), p 4.

[6] See, e.g., BEIS (2017), para. 2.35. See also BlackRock (2021), p 6, for one example out of numerous financial institutions that are making a strong push for robust climate-related risk disclosure and incorporating investee companies' disclosure records into voting on management and shareholder proposals. Indeed, based on data from five major markets (including Europe and the US), there is some suggestive evidence of sizeable capital shifts from investing in carbon fuels towards new opportunities that will support the transition to a low-carbon economy. On this point, see GSIA (2020); Ilhan et al. (2019).

[7] See FRC (2020b), p 4. In this review, the FRC observed that 'it is the board's responsibility to consider climate-related issues, but there is little evidence that business models and company strategy are influenced by integrated climate-considerations into governance frameworks.' For criticism generally of shareholder stewardship, see, e.g., Talbot (2013), p 791; Kay (2012), Chapters 1–5.

[8] Climate risk, for the purpose of this article, is a term used to describe the cumulative financial risks that companies face because of climate change. Climate risk includes operational risk, insurance risk, regulatory risk, shareholder risk, capital risk, competitive risk and litigation risk.

[9] A company's impact on the climate, for our purposes, refers to its external 'costs', i.e., any cost borne by the natural environment, society and/or individuals as a result of the company's activities but without any financial cost to the company.

constructs datasets on the 2019/2020 annual reports and accounts of FTSE All-Share companies in the fossil fuel producers sector. This sector was chosen because oil and gas exploration and development companies produce outsized and severe effects in respect to climate change. Simultaneously, there are multiple climate-related risks to the sector—each of which could have a negative impact on operational and financial performance of businesses that profit from fossil fuels. Second, the article uses mixed empirical method to examine the quantity and quality of climate-related risk disclosure in this sectoral profile dataset relative to the requirements of the Companies Act 2006. This is undertaken to determine the extent to which disclosure as a concept and policy goal achieves its self-identified function of managing the socio-economic risks and impacts of climate change. Its conclusions situate academic opinion and policy choices in a richer empirical framework of the *actual* substantive effects and outcomes of relying on disclosure to integrate ecological imperatives into corporate purposes and decision-making processes.

The corresponding structure of this article is as follows. To set the scene, Part 2 explains the function of climate-related disclosure and stakes out the tensions that exist in respect to its practical impact on corporate life and climate change. Following on from this, the article establishes the relevant climate disclosure requirements that apply currently to entities under UK company law and governance. Part 3 then delineates the methodology and parameters of this empirical study. In so doing, it explains how the article fills gaps in the empirical literature on this topic, given it is the first study to assess the impact of climate disclosure applicable to companies based on a dataset on all British fossil fuel producers in the most authoritative performance Index of the London equity market. Part 4 presents the findings, which are one of the innovations of this article. Part 5 offers some concluding remarks.

2 The UK's Approach to Climate-related Risk Disclosure

2.1 Objectives and Limits of Disclosure

In the past decade, the British government began to substitute the historically voluntary character of non-financial disclosure initiatives[10] for mandatory disclosure of a company's climate-related risk and impact.[11] Properly understood, disclosure of this type is the ultimate legal and regulatory expression of a compromise solution that engages a market focus with government reformist overtones. Thinking about disclosure rules in this way allows us to re-envision the legal system as being

[10] For a succinct account of the weaknesses of the voluntary regulatory agenda, see Villiers (2006), pp 247–251.

[11] Much of this originates from EU directives or regulations. For instance, The Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013, SI 2013/1970, was in response to 'Accounting Directive' 2013/34/EU that deals with corporate reporting obligations. In 2014, 'Non-financial Disclosure Directive' 2014/95/EU inserted into the 2013 Directive a requirement to disclose non-financial information. This was transposed in the UK, which now requires a directors' strategic report. For an excellent recent overview of the EU's legislative approaches to corporate reporting, see Webster (2020), pp 286–290.

'grounded in long-established broader legal cultures and traditions'.[12] Of central importance in this regard is the passive regulatory conception of the UK state and the extent to which it encourages market-invoking regulatory solutions. It is, after all, 'a jurisdiction that [has] for several centuries actively promoted local and market-based solutions to identified problems',[13] which is a version of political liberalism that emanates from a longstanding and ingrained 'wariness towards the central state apparatus'.[14] Whilst one can identify a departure from, or the disintegration of, this conception during the post-World War II period, and in a more pronounced way during the past 50 years, many of the classic examples of corporate and non-corporate market-invoking regulation in the UK are in large part a product of this conception, and its mark is still impressed on contemporary lawmaking approaches to the regulation of the company.[15] Today, mandatory climate-related disclosure is both comprehensible and congruent with this political outlook.

The function of this type of disclosure is to focus attention at board level on the company's exposure or contribution to climate change and enable it to communicate verifiable information to investors in order to improve the accuracy of share prices and capital allocation.[16] Yet disclosure rules do not prescribe behavioural change on the part of companies. Whether organisational behaviour does change is contingent on disclosure triggering some *additional* response that might, in turn, prompt companies to identify and address their climate risks or impacts.[17] This response potentially will be external to the company, in the sense that mandatory disclosure rules co-opt the community of investors and others to engage in practices that lead to targeted behaviour change of corporate decision-makers. In this way, disclosure is depicted as necessary to help the market to evaluate the nature of investee companies' climate risk or impact and, to the extent that they are viewed as questionable, reduce its valuation of the company to take account of these events, their likely future occurrence, and the quality of the existing board of directors. The theory is that informed market judgment (e.g., investment decisions about where to allocate capital, engagement with companies, proxy voting and dialogue with fund managers and policy-makers) should exert a restraining influence on the exercise of managerial authority when forming corporate purposes and decisions. In particular, it may encourage long-term thinking required for committing investment into technological innovation, reduced carbon-intensive activities, energy use efficiencies, etc. Placing non-financial disclosure in a market-based framework is considered to produce socially progressive effects,[18]

[12] Morrow (2019), p 973.

[13] Kershaw (2016), sections 3.07–3.10.

[14] Ibid. There is a significant body of scholarship on the passive conception of the UK state. See generally Fox (1985); Jenks and Green (1977); Kahn-Freund (1969).

[15] Kershaw (2016), sections 3.07–3.10.

[16] BEIS (2019), p 6.

[17] Parkinson (2003), p 4.

[18] Choudhury and Petrin (2018), p 402.

albeit instrumentally,[19] which will ultimately support the transition to a low-carbon economy and make corporate boards more accountable generally for their actions.[20]

Although climate-related disclosure regulation now occupies a central position in UK company law, the mandatory disclosure obsession has had many critics. Some find to be unconvincing the exploitation of shareholder self-interest for social or public purposes on the basis that neither shareholders nor their intermediaries will voluntarily accept stewardship obligations that restrict their ability to pursue value maximisation strategies of liquidity, short-termism and low involvement in corporate governance.[21] Others object to the disclosure quality or the relevance of climate-related information to investment strategies that are aligned with environmental principles.[22] Although this debate about the practical utility of disclosure provides us with rich and theoretically informed conflicting sides, it has provided no resolution as to which side we should join. The meagre amount of empirical evidence does not settle the theoretical conflict.[23] The question then becomes what to do when theory and real-world evidence fail to offer a clear regulatory account of the power of disclosure to increase board-level responsivity to climate change. Disagreements at this level of varying points of view can be settled only by considerably richer and dispositive empirical analysis than previous efforts. It is to this evidence that we will turn after setting out the primary and secondary legislative provisions that may be interpreted to require companies to disclose climate-related risk or the impact of their business activities on the climate.

2.2 The UK's Legal-Regulatory Approach to Climate-Risk Reporting

Although 'climate change' is not mentioned specifically as a required topic for disclosure under the company law ruleset, there are several ways in which climate-related matters, or areas where climate change may be material, will nevertheless need to be disclosed. Most obviously, climate change and its associated risk is plainly contemplated under Part 15 of the 2006 Act. First and foremost, section 414A was introduced in 2013,[24] requiring the directors of a company to prepare

[19] On the popular idea in environmental law discourse that marketised approaches exemplify a movement towards valuing the environment by a process of commodification, see, e.g., Alexander (2004).

[20] Villiers (2006), pp 232–233.

[21] Talbot (2013). This criticism is complicated further due to the UK's pattern of quoted share ownership, in which a separation tends to exist between institutional investors as registered shareholders and the ultimate beneficial owners of shares, thus adding an additional level of separation between beneficial shareholders and corporate boards. For recent data on ownership of UK quoted shares, see ONS (2020).

[22] FRC (2020b), pp 7–8.

[23] Empirical analysis in academic legal literature has been confined to insights into only companies with the largest market capitalisations on the FTSE 100, and tends to be posed at a more general level of observing 'sustainability' in corporate reporting or engagement of non-shareholder corporate constituencies. See, e.g., Iqbal and Keay (2019); Esser et al. (2018).

[24] The Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013, SI 2013 No 1970. It has since been updated through The Companies, Partnerships and Groups (Accounts and Non-Financial Reporting) Regulations 2016, SI 2016 No 1245. This provision replaced the previous require-

a strategic report for each financial year.[25] The purpose of this report is to inform shareholders of the company and help them assess how the directors have performed their duty under section 172.[26] It must provide: (a) a fair review of the company's business; and (b) a description of the principal risks and uncertainties facing the company. On this basis, a company's legal duty to disclose 'material' risks is clear and this duty applies equally to climate risk.[27] Second, section 414CZA(1) obliges larger companies, irrespective of listing status, to include a separately identifiable and factual section 172(1) statement in the strategic report.[28] Its purpose is to inform and help the marketplace assess how the directors have had regard to the matters set out in section 172(1)(a)-(f) in reaching principal decisions, including situations where boards may not have engaged on all such matters with impacted stakeholders.[29] Section 172(1)(d) relates to the impact of the company's operations on the environment, which could include board evaluation of the immediate impact of principal decisions on climate change, but also the impact of the company's operations on the long-term climate conditions.[30] Third, certain larger companies must also include in the strategic report a so-called non-financial information statement,[31] which requires information relating to, amongst other things, environmental matters, including the impact of the company's business on the environment.[32] This means companies should describe the policies pursued in relation to the environment,[33] the

Footnote 24 (continued)
ment for the production of a business review that was introduced in 2005. The business review was introduced into the Companies Act 1985 by SI 2005/1011.

[25] Section 414C(2) sets out the overall framework and main principles for the content of the strategic review. See also, sections 414B and 382, which exempt small businesses. A company qualifies as small in relation to its financial year if two or more of the following qualifying conditions are met: annual turnover must be not more than £10.2 million; the balance sheet total must be not more than £5.1 million; the average number of employees must be not more than 50.

[26] CA 2006, s 414C(1).

[27] FRC (2018), para. 68.

[28] Section 414CZA was inserted into the Companies Act 2006 via The Companies (Miscellaneous Reporting) Regulations 2018, SI 2018 No 860. Subsection (2) of the provision exempts medium-sized companies. The qualifying criteria for medium-sized companies is set out in CA 2006, s 465. However, because CA 2006, s 414CZA(2), refers to s 467 it appears that AIM and other public companies *irrespective of listing status* will be caught even if they are small or medium-sized. Therefore, a company that meets the medium-sized criteria in s 465 but is excluded from being treated as medium-sized because it is ineligible under s 467 is required to produce a section 172 statement.

[29] This was arguably the intention of the Company Law Review Steering Group in its original vision of the operating and financial review (OFR). See DTI (1999), para. 5.1.47. In spite of popular support from accounting and business circles, the OFR was withdrawn and substituted for a less prescriptive business review. On this amendment, see Johnston (2006).

[30] See FRC (2018), section 8.

[31] CA 2006, s 414CA. The non-financial information requirement applies only to a limited number of 'public interest entities', such as a 'traded company'. According to CA 2006, s 360C, a traded company means a company whose shares carry rights to vote at general meetings, and are admitted to trading on a regulated market in an EEA State. An example of a UK regulated market is the LSE's main market. In contrast, AIM is not a UK regulated market but instead falls within the definition of a UK multilateral trading facility (within the meaning of the FCA Handbook).

[32] CA 2006, s 414CB(1)(a).

[33] CA 2006, s 414CB(2)(b).

outcomes of such policies,[34] and non-financial key performance indicators against which the impact of the company's activity can be measured.[35] This statement is expected to include climate change where material to the company. Fourth, secondary legislation, which already required companies to disclose relevant environmental issues in their directors' reports,[36] now requires quoted companies[37] to report methodologically transparent global greenhouse gas emissions for which they are responsible and an intensity ratio alongside total global energy use and information relating to energy efficiency.[38]

Also relevant in this regard is the Financial Reporting Council (FRC) Guidance on the Strategic Report, which serves as a best practice statement and, as such, has persuasive rather than mandatory force.[39] Notwithstanding, the guidance incorporates certain important mandatory legislative or other regulatory requirements relating to the strategic report,[40] and emphasises where companies may need to consider climate change, including within their disclosures on their business environment, and principal risks and uncertainties.[41] Importantly, the FRC is responsible for ensuring compliance with company disclosure requirements in the 2006 Act. Although the FRC generally proceeds on a consensual basis where non-compliance has been identified, it has the power to request from the courts a declaration of non-compliance and an order requiring the preparation of a revised report.[42] Failure of a company to comply with reporting requirements can also have the potentially less tangible, but no less significant, effect of damaging its reputation and investor confidence in it and its management. Finally, the Corporate Governance Code, which applies on a 'comply or explain' basis to all premium listed companies, provides specific information on the discharge of the section 172 duty in annual reports.[43] Provision 28 of the Code also instructs boards to conduct 'a robust assessment of the company's emerging and principal risks'. Such risks are defined as 'events or circumstances that might threaten the company's business model, future performance, solvency or

[34] CA 2006, s 414CB(2)(c).

[35] CA 2006, s 414CB(2)(e) and (3).

[36] The Large and Medium-Sized Companies and Groups (Accounts and Reports) Regulations 2008, SI 2008 No 410.

[37] Quoted companies in this respect are those whose equity share capital is included in the UKLA's Official List. An AIM company is not a quoted company. On this point, see CA 2006, s 385(2). This distinction represents the government's intention to 'reduce the regulatory burden on companies' and as such limited the scope of the provision to quoted companies. See DEFRA (2012), pp 12–14.

[38] CA 2006, s 416(4), transposes The Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013, SI 2013 No 1970, and, on or after 1 April 2019, The Companies (Directors' Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018, SI 2018 No 1155. This secondary legislation implements the UK government's policy on Streamlined Energy and Carbon Reporting (SECR).

[39] FRC (2018).

[40] See, e.g., The Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013; The Companies, Partnerships and Groups (Accounts and Non-Financial Reporting) Regulations 2016; and The Companies (Miscellaneous Reporting) Regulations 2018.

[41] Ibid., paras. 7B.22 and 7B.27.

[42] CA 2006, s 456.

[43] Provision 5.

liquidity and reputation'. Climate-related risks would seem to fall squarely within this definition.[44] Small and mid-sized companies in the UK are required, under AIM rules, to adopt a recognised corporate governance code, which is normally either the Corporate Governance Code or the outcome-oriented, if less prescriptive, Quoted Companies Alliance (QCA) Corporate Governance Code.[45] Principle 4 of the QCA requires in-scope companies to embed effective risk management, considering both opportunities and threats, throughout the organisation. For many companies, this provision will require consideration of climate change and its associated risks.

In respect to other relevant legal duties, the reference in section 414C(1) to the purpose of the strategic report being to help shareholders assess how the directors have discharged their section 172 duty is a reference to the duty of good faith, which is traditionally presented as an important branch of the duty of loyalty.[46] Section 172(1) specifies that directors must act in good faith 'to promote the success of the company for the benefit of its [shareholders] as a whole'. In doing so, directors 'must have regard to' a non-exhaustive list of less tangible considerations, which include the likely consequences of any decision in the long term and the impact of the company's operations *on the environment*; however, these are expressly instrumental to advancing the company's interests *for the benefit of its shareholders*. In spite of the academic or practitioner consensus narrative that this express duty to consider non-shareholder corporate constituencies has failed to drive more purposeful companies as a means of generating wealth through a more inclusive form of capitalism,[47] the UK government decided against amending the provision, and instead elected to animate its 'enlightened' behavioural instruction through the strategic report.[48] Accordingly, since this duty is the purpose of the strategic report, it must be kept in mind when determining whether the strategic report complies with its particular legal requirements. The second relevant legal duty to recognise is section 174.[49] This interrelated provision instructs the directors of a company to 'exercise reasonable care, skill and diligence' when performing their duties, and this will apply when approving the strategic report. As part of this duty, English courts have

[44] Ibid. In light of these provisions, where climate change presents a material financial risk to the company, compliance with the Code would require companies to disclose this risk and its implications for the company in the long term. A company's failure to (adequately) do so—or a company's failure to comply with the Code at all—could indicate that directors have also failed to comply with their general duties. As such, though largely voluntary, the Code may help elicit evidence to ground a claim for breach of directors' duties for failure to adequately assess and manage climate risk.

[45] AIM Rule 26, https://docs.londonstockexchange.com/sites/default/files/documents/AIM%20Rules%20for%20Companies%20%2801012021%29_1.pdf (accessed 21 March 2022).

[46] While the good faith requirement is often stated to provide for a purely subjective duty, there is little doubt that an objective standard will be applied by the courts. See *Charterbridge Corporation Ltd. v Lloyd's Bank* [1970] Ch. 62, at 74.

[47] Johnston (2020), pp 209–210; Attenborough (2014), pp 418-427; Moore (2013), pp 191-195.

[48] BEIS (2017), para. 2.45.

[49] The standard of care to be exercised under this duty is: '… the care, skill and diligence that would be exercised by a reasonably diligent person with (a) the general knowledge, skill and experience that may reasonably be expected of a person carrying out the functions carried out by the director in relation to the company, and (b) the general knowledge, skill and experience that the directors has.'

often recognised that directors of a company have, both collectively and individually, a continuing duty to proactively monitor risks to the business.[50]

In principle, the abovementioned rules that require companies to report on climate-related matters, or areas where climate-related challenges may be material, are considerable and extensive. However, policy or academic opinion is mixed about compliance intensity, which, in turn, casts doubt on the practical utility of mandatory disclosure.[51] The central inquiry of this article, therefore, presents and analyses unique research to explore if and the extent to which carbon-intensive companies are clearly and reliably: (a) integrating into their overall business risk management those material risks that climate change presents to immediate and long-term activities; and (b) reporting on the impact of their business activities on the climate and the likely consequences of any business decisions in the long term. Both questions, of course, are empirical in nature. It is axiomatic that empirical analysis can reveal counterintuitive patterns and test our basic assumptions about the world.[52] Notwithstanding, empirical research in law is not well developed, and often normative conclusions are based on intuitive assessments or anecdotal evidence.[53] Why this is so remains an open question. One possible explanation is that

> empirical analysis demands significant resources and requires skills not commonly taught within our law schools; further, our legal tradition seems to discourage data collection and analysis, with the result that we may not understand or value the potential of this sort of scholarship.[54]

Yet many important standards in company law and governance are based on assumptions about how the world works.[55] On this basis, the article establishes the *actual* effects and outcomes of relying on disclosure to address and resolve corporate responsiveness to the climate emergency. In doing so, it demonstrates some of the broader utilities of mixed empirical method and contributes to the overall body of empirical legal research within the UK.

3 Empirical Analysis and Methodology

The areas of the article's assessment of climate-related disclosure addressed are outlined as follows. This study constructs a dataset of the annual reports and accounts of companies listed under the fossil fuel producers sector of the UK's FTSE All-Share Index for the 2019-2020 financial year period. The FTSE All-Share Index captures 98% of the UK's market capitalisation of listings on the London Stock

[50] *Secretary of State for Trade and Industry v Baker (no 5) (Re Barings)* [1999] 1 BCLC 433, 489.

[51] Ferran (2004), p 132.

[52] Dignam and Oh (2019), p 19.

[53] On this observation about company law, see Armour (2002), p 468. On the absence of empirical legal scholarship more generally, see Heise (1999), p 834; Rhode (2002), pp 1357–1358.

[54] Dignam and Oh (2019), p 19. See also Kritzer (2010), p 881.

[55] Strine (2002), p 499.

Exchange's main market, and is considered to be the best performance measure of the London equity market.[56] Indexes such as these are used by investors looking for broad exposure to individual industries through sector-specific exchange-traded funds, or to help compare a company's performance against its peers. The classification of a company is determined by its primary source of revenue and other publicly available information. The fossil fuel producers group covers the biggest energy majors, including BP and Royal Dutch Shell, and growth companies involved in oil and gas exploration and production, such as Cairn Energy and Tullow Oil. Although carbon-intensive companies listed on this index comprise a low aggregate market capitalisation, at least relative to the markets as a whole, the sector produces outsized and severe effects in respect of indirect and cumulative impacts of human activities and climate change.[57] Simultaneously, fossil fuels are concentrated in these companies' value chains and drive their short-term returns, but failure to promptly address material risk exposure to climate change presents an existential threat, not only to the climate but also to the company's business and its investors. Climate change could expose a company to increased operating costs, increased capital costs, the potential for assets (e.g., exploration licences, oil and gas reserves, or infrastructure required to develop those reserves) to become 'stranded', reputational damage and/or a reduced market valuation. Consequently, fossil fuel producers are facing a critical challenge as the Paris Agreement aims to shift the global economy towards renewable energy transitions, and—perhaps unsurprisingly—are coming under increasing scrutiny.

The data analysed include text and numerical data gathered from public corporate documents that were produced by the fossil fuel producers to communicate their approach and strategy in respect to climate-related issues. The documents examined were annual reports and accounts for the 2019/2020 financial year period. As mentioned above, companies produce annual reports and accounts due to mandatory requirements set out in the 2006 Act.[58] The annual report is an essential method of communication between the board and shareholders. But in addition, its content elements might be of interest to other investors (such as debt investors and potential investors) and creditors. Other stakeholders such as customers, employees and the general public may also wish to use information contained within it.[59] Although the report is arguably the most important means of corporate communication,[60] it is also an obvious way of keeping market actors informed about the company's position, performance and strategy.[61] It is considered to have credibility as a communication

[56] The FTSE All-Share Index captures the aggregation of the FTSE 100 Index and the FTSE 250 Index, which are together known as the FTSE 350 Index and the FTSE SmallCap Index. See https://www.lse.co.uk/share-prices/sectors/fossil-fuel-producers/ (accessed 21 March 2022).

[57] Heede (2014), p 234; Hmiel et al. (2020), p 409.

[58] In October 2020, the FRC issued a discussion paper that explores proposals for change to the concept of the annual report that would displace it from the traditional single paper-based version and into a series of 'network reports'. See FRC (2020a).

[59] Parguel et al. (2011), p 16.

[60] Adams et al. (1995), p 92.

[61] Bebbington and Gray (2000), p 15.

channel because it includes legally required and audited financial statements,[62] which the company's board knows will be scrutinised.[63] Companies increasingly include a substantive CSR/sustainability report, designed to structure the company's legitimacy,[64] and provide to market actors an integrated analysis of ESG data.[65] Similarly, sustainability report publication can be assumed as material for influencing or changing public opinion of them as companies and the extent to which they contribute to sustainable growth.[66] While many FTSE All Share companies produce a sustainability report and the annual report, or publish sustainability information on their websites, this study focuses on disclosures in annual reports and accounts in light of the fact that ESG-type reports are rarely audited although they may be subject to some internal or external verification process. Our approach, however, acknowledges any reference in annual reports and accounts to supplementary publications by recording those references.

The search produced profile data for 120 fossil fuel producer constituents in the initial dataset, which was then refined in a number of ways. The dataset was first pared to contain only companies that were formed and registered under British companies' legislation. Second, although the classification of a company, as noted above, is determined by its primary source of revenue and other publicly available information, the sector information contains a limited number of inconsistent or inexact constituent profiles. Accordingly, each company within the dataset was examined carefully for relevance. Companies lacking available reporting information were set aside,[67] as were those where the company has been placed into liquidation,[68] the main business objects are no longer fossil fuel production,[69] or the company was formed for the purpose of acquiring another company, business or asset that has operations in the industry sector.[70] The final dataset comprised 60 companies,[71] generating the same number of annual reports and accounts over the relevant reporting period, which were coded for both descriptive and interpretative data. Basic factual information about each company was collected and recorded in categorical ways, such as the specific part of the FTSE All-Share Index to which a company is listed, the recorded market capitalisation, and the stated business objects of the company within the industry sector. An electronic word search was used to identify any reference to specific climate or environmental topics in annual reports and accounts. To detect these topics, combinations of seven most common or most likely used search

[62] Hines (1982).

[63] Bebbington and Gray (2000), p 6.

[64] Deegan (2002), p 283.

[65] Aureli (2017), p 1.

[66] Deegan (2002), p 292.

[67] See G3 Exploration Limited (G3E); Gail(India)gdr (GAID); Reliance Gdr (RIGD); Westmount Energy (WTE).

[68] See Xcite Energy.

[69] See Zoetic International.

[70] See Xplorer.

[71] See Appendix. The complete fossil fuel producers sector constituents are available at: https://www.lse.co.uk/share-prices/sectors/fossil-fuel-producers/constituents.html (accessed 21 March 2022).

terms were selected: "climate change", "climate risk", "climate impact", "environmental risk", "environmental impact", "carbon" and "emission"; any occurrences of climate disclosure were stored in a database and analysed to answer both substantive questions outlined above.[72] It is important to make a distinction between the specified climate-related topics and the search phrases. The search phrases are used to identify references to particular topics and are not topics in their own right.

The next stage involved the development of categories into which the unit of analysis is coded.[73] They provide a focus for capturing the extent of principal climate-related disclosures that can be reasonably expected to be discussed in annual reports and accounts under the current legislative framework. Four broad categories were used as our code of analysis of the data, which are set out below as precisely as practicable.

> ***Risk.*** This category involves consideration of the disclosures that are made and that relate to: (a) a fair review of the company's business; and (b) a description of the principal climate risks and uncertainties facing the company's operations.[74] It could include, for example, quantitative or qualitative assessment, a link to shareholders and financial performance of the business, mitigation or management of the risk, etc.
>
> ***Impact***. This category considers if and to what extent boards are describing how the company's operations may impact the climate, and discussion of the implications of the climate impacts the organisation has identified where such information is material.[75] Impact in this regard is non-financial in nature, and can be assessed on the basis of probable, and perhaps even actual, high, medium and low impact on the climate.
>
> ***Accountability***. Identifying criteria might include what companies recognise as their responsibilities and objectives, which in one sense indicates active and strategic alignment with the Paris Agreement. If the company has adopted a net-zero objective, for example, it could be adopted in the entity's articles of association or other constitutive documents. Or again, responsibility for achieving objectives must be allocated to specific individuals within the entity and linked to performance incentives.
>
> ***Management***. This category refers to a systematic approach to board-controlled management of a company's climate-related risks or impacts. It captures any form of internal management system or external accredited system, if

[72] A sample of 10 annual reports and accounts were tested to ensure that an optimum set of search phrases was used, i.e., that the best possible return of occurrences could be achieved using the minimum amount of search phrases. As a result, several search phrases were replaced, added or removed to reach the final set considered in the main text of the article. A total of 20 per cent of companies in the sample returned null results after the word search was carried out. To ensure that no reference to climate-related topics had been overlooked, all companies with null results were scanned for additional words: "ecology", "greenhouse" and "GHG". A subset of companies with null results was submitted to a repeat word search.

[73] Ingram and Frazier (1980), pp 615–616.

[74] CA 2006, ss 414C(2)(a)-(b).

[75] CA 2006, ss 172 and 414CZA.

the board has conducted 'scenario analysis'[76] on the company's current assets and liabilities, as well as procedures and controls for assessing impact of the company's operations on the climate. This category includes any disclosures made on key performance indicators as measured against, for example, a climate policy, and the demonstration of their achievements.

The word search and record creation process are as follows: (1) find the paragraph that contains the search phrase; (2) identify if the search phrase is used in a climate-relevant context; and (3) identify the designated category to which the paragraph refers. The search results were logged in an MS Excel database with the relevant text passage and/or screenshot of figures and tables, the section of the accounts, the page number, the relevant climate topic and a flag indicating whether the disclosure was quantitative or qualitative. During the search, several guidelines were applied to avoid double counting or omissions of references. The search required some degree of discretion, as not every occurrence of a search phrase can be assigned definitively to a climate category. In other cases, search phrases appear in an extremely vague climate-related context, or in extremely general statements, and it might be decided not to record that occurrence. It is important to note again that it was not the aim of the word search to pick up every single occurrence of all search phrases, but to use the search process to identify all climate-related topics that a company discusses in its annual report and accounts. As the focus of this study is climate disclosure, any occurrence of a search phrase used in a non-climate context was excluded from the database. Repetitive occurrences of a search phrase in one paragraph were recorded once. If a paragraph addresses one specific climate category, but contains several search phrases of that category, only one occurrence was recorded. Occurrences of search phrases were excluded in repetitive statements, i.e., identical wording in different parts of the report. Occurrences of search phrases were excluded in reviews of the extant legislation if they did not contain any company-specific information. If these ancillary rules were not adopted, companies would be rewarded for using the same word many times to discuss one issue. The objective of this article is to determine which issues are disclosed by FTSE All Share companies rather than to count words.

Nevertheless, an unavoidable set of concerns exist about the objectivity of any content analysis such as this one. First, this research does not intend to provide an overall grade, score, or ranking of companies. However, recording and analysis of climate disclosure levels or quality involves a degree of choice, based on indicators such as the extent of quantitative information or discussion of the financial implications of climate change. Although substantial care has been taken to record and analyse raw data or results in an objective manner, some subjective choices are required when analysing qualitative statements. This does not mean the chosen approach is inherently susceptible to selection bias as a specification error; manual recording

[76] Recommended by the Task Force on Climate-Related Financial Disclosures (TCFD), scenario analysis helps organisations to track what risk profiles would look like under varying degrees of warming including the Paris Agreement's 2 °C trajectory. See TCFD (2017).

is necessary and not an irredeemably arbitrary or imprecise process that precludes quality empirical analysis.[77] In fact, an overall understanding of a complex mixture of quantitative and qualitative disclosure content is enhanced by the ability to discern, process and share information in different ways.[78] Second, in spite of the explanatory value of regression/causal analysis, this method would not be practically feasible because our n=60.[79] More precisely, in the social sciences there are typically 'single n' (i.e., with 1 to 9 observations) that apply qualitative methods, and studies with 'triple (or more) n' (i.e., >100 observations) that apply regression analysis, formal statistics, etc. Yet for the range in-between (i.e., 10 to 99 observations) the two methods are less suitable. This is because 20 or more observations would be required for each explanatory variable. An n=60 would limit us to approximately three or four variables that might explain disclosure patterns in a particular way; this would most likely lead to an omitted variable bias in the sense that a larger number of factors are most likely to contribute to modes of disclosure. Third, the dataset is planned and constructed from the disclosures of British companies in the fossil fuel producers sector. Thus, it excludes companies across different sectors and geographical areas. For this reason, we make no claim that our dataset of climate-related disclosures, or the empirical results we present, is a complete ontology of disclosure quality in a general sense. Nor are we claiming that the disclosure quality of companies in different sectors will not differ significantly. However, more data is not always better.[80] Although our sectional analysis is anything but representative of all companies with access to a share market, it is quite large and has substantial representativeness of corporate economic size in an industry that is customarily regarded to be most exposed to, and liable for, the challenges of climate change. This provides for variability at the organisational level and a cross-sectional baseline for climate change-related disclosure, which in turn generates meaningful content analysis and empirical results.

4 Results

This section presents the most notable results from our data collection and analysis. It presents general findings about trends within the entire dataset. In so doing, it also presents specific findings from substantive disclosures about climate change to the marketplace.

[77] Epstein and Martin (2010), p 911.
[78] See Kritzer (1996).
[79] A useful overview of regression analysis can be found in Colin (2013).
[80] Adams (2017), pp 461–462.

4.1 Climate Change and Associated Risk Disclosure

The need for companies to meaningfully consider, manage and disclose the risks and uncertainties associated with climate change is now widely recognised.[81] The FRC Guidance also makes clear that companies should not only disclose the risks facing their business, but also provide details about financial implications and the actions being taken by the company to manage and contain them.[82] Against this legal-institutional backdrop, the first part of our analysis finds that 38 of the 60 companies do not mention the term ‘climate’ (or anything similar) in the core business information and risks section of the annual report. In this sub-group, three companies are quoted on the main market, while a substantial majority of 35 are AIM small/mid-cap companies.[83] This substantial majority of disclosures that make no clear reference to climate change is considerably higher than the results of a recent FRC review, published in late 2020, which conducted a cross-sectional short analysis of industries with greater climate change exposure. The results for oil and gas companies included in that study indicated a comparatively low incidence of non-disclosure of climate-related principal risks linked to specific areas of the business and strategy.[84] In part, this variance of results may be attributable to the larger and more diverse dataset of our sample, including *all* British fossil fuel producers with traded securities, not just those in the premium segment, as was the case in the FRC study. This, we consider, may allow some macro-perspective on oil and gas companies that are required to disclose information about risks, trends and impacts associated with climate change as a matter of law.

By failing to make any disclosure about climate-related exposure, the 38 strategic reports considered have failed to present information satisfying the specific requirements of the Companies Act 2006. In particular, these reports do not contain: ‘a fair review of the company’s business’,[85] and do not include a proper ‘description of the principal risks and uncertainties facing the company’.[86] For the ‘fair review’ test, the FRC Guidance explains that the analysis of the entity’s development, performance and position ‘should make reference to... factors that may affect future cash flows’,[87]

[81] CA 2006, s 414(C)(b).

[82] FRC (2018), para. 7A.32.

[83] However, two AIM companies that failed to reference climate change in a ‘Principal Risks and Uncertainties’ section of the strategic report did note it, if briefly, and without cross-referencing, elsewhere in another component of the annual report. See Jersey Oil & Gas, Annual Report and Accounts 2019, pp 5 and 12; Block Energy, Annual Report and Accounts 2019, p 18. A third AIM company within this subsample acknowledges as a material risk to the business only *the impact of its operations on the environment* and the possible associated market reaction. See Pantheon Resources, Annual Report and Accounts 2019, pp 12–13. Although articulation of this type of risk is not, standing alone, contrary to the specific disclosure requirement, it elides principal risks facing the company’s operations from a transition to a low-carbon economy, and the physical risks to the entity’s operations posed by climate change.

[84] FRC (2020b), p 16 (see especially the detailed findings on how companies are developing their reporting on climate-related challenges).

[85] CA 2006, s 414C(2)(a).

[86] CA 2006, s 414C(2)(b).

[87] FRC (2018), para. 7A.62.

which could be 'relative to the external environment in which it is operating'.[88] The FRC Guidance goes on to state that '[t]he strategic report should focus on those matters that are material to an understanding of the development, performance, position or future prospects of the business'.[89] It also explains that 'information is material if its omission or misrepresentation could reasonably be expected to influence the economic decisions shareholders take on the basis of the annual report as a whole.'[90] On this basis, the decision as to how much information to put in the strategic report in relation to climate change and its associated risks is a decision that the directors must exercise their judgment on, based on: the likelihood or potential magnitude of climate risks having an impact on the company's future position; whether its omission or misrepresentation could influence economic decisions of shareholders; the desirability of the company maintaining a reputation for high standards of business conduct;[91] and exercising reasonable care and skill.[92] It is submitted that in omitting any climate change information in the strategic report, the directors of the respective companies have failed to meet any or all of these legal tests. Considering abundant publicly available information on climate change and its risks, any reasonable director or reasonable board of directors of any UK fossil fuel producer would or should conclude that climate change is a material factor that is likely to affect the business and should therefore be properly disclosed in the strategic report.

The strategic reports of other fossil fuel producers show that climate risk is clearly regarded as a material factor and/or principal risk to the sector. For example, the following extract can be used as an illustration of a company that does at least refer to climate risk.

Royal Dutch Shell (a much larger FTSE 100 fossil fuel producer than any other of the non-reporters, and therefore expected to report in greater detail than this cohort, but nevertheless facing material risks from climate change) identifies climate change as a 'risk factor' in its 2019 Strategic Report, stating:

> We expect that a growing share of our GHG emissions will be subject to regulation, resulting in increased compliance costs and operational restrictions. If our GHG emissions rise alongside our ambitions to increase the scale of our business, our regulatory burden will increase proportionately. We also expect that GHG regulation, as well as emission reduction actions by customers, will continue to result in suppression of demand for fossil fuels, either through taxes, fees and/or incentives to promote the sale of lower-carbon electric vehicles or even through the future prohibition of sales of new diesel or gasoline vehicles, such as the prohibition in the United Kingdom (UK) beginning in 2035. This could result in lower revenue and, in the long term, potential impairment of certain assets.

[88] Ibid., para. 7A.63. This could include trends in the legal regulatory, macro-economic environment and changes in societal expectations.

[89] Ibid., para. 5.12.

[90] Ibid., para. 5.1.

[91] CA 2006, s 172(1).

[92] Ibid., s 174.

> In addition, the physical effects of climate change such as, but not limited to, rise in temperature, sea-level rise and fluctuations in water levels could adversely impact both our operations and supply chains.…
> Additionally, some groups are pressuring certain investors to divest their investments in fossil fuel companies. If this were to continue, it could have a material adverse effect on the price of our securities and our ability to access capital markets. Additionally, some groups are pressuring commercial and investment banks from financing fossil fuel companies. Furthermore, according to press reports, some financial institutions also appear to be considering limiting their exposure to certain fossil fuel projects. Accordingly, our ability to use financing for future projects may be adversely impacted. This could also adversely impact our potential partners' ability to finance their position of costs, either through equity or debt.
> If we are unable to find economically viable, as well as publicly acceptable, solutions that reduce our GHG emissions and/or GHG intensity for new and existing projects or for the products we sell, we could experience additional costs or financial penalties, delayed or cancelled projects, and/or reduced production and reduced demand for hydrocarbons. This could have a material adverse effect on our earnings, cash flows and financial condition.
> If we are unable to keep pace with society's energy transition or we are unable to provide the desired low-GHG-emissions products needed to facilitate society's energy transition, it could have a material adverse effect on our earnings, cash flows and financial conditions.[93]

Larger companies like Royal Dutch Shell might be expected to report on those risks in greater depth than, for example, the mean small/mid-sized AIM company. But clearly, all fossil fuel producers, to date, face risks of a material nature from climate change and those risks should at the least be recognised in the strategic report.

In respect to the 'principal risks and uncertainties facing the entity', the FRC Guidance states that

> [t]he risks and uncertainties included in the strategic report should be limited to those considered by the entity's management to be material to the development, performance, position or future prospects of the entity. They will generally be matters that the board regularly monitor and discuss because of *their likelihood, the magnitude of their potential effect on the entity, or a combination of the two*.'[94] [emphasis added]

As to what is a 'principal' risk, the FRC Guidance states that '[t]he terms 'key'… and 'principal' … refer to facts or circumstances that are (or should be) considered *material to an understanding of the development, position or future prospects of the*

[93] Royal Dutch Shell, Annual Report and Accounts 2019, p 29. For another example, see Longboat Energy, Annual Report and Accounts 2019, pp 8–10.
[94] FRC (2018), para. 7A.28.

business'[95] [emphasis added]. Climate-related risk is clearly contemplated within this definition.[96] The relevant section of the strategic report where all 38 companies report on the principal risks and uncertainties facing the business makes no reference at all to climate change or any of the associated risks that are described above. It is submitted that a reasonable director or reasonable board of directors of any UK fossil fuel producer exercising the reasonable care, skill and diligence required under CA 2006, s 174, would and should regard climate change as a risk that is material to shareholders' understanding of the business and that this should be properly reflected in the strategic report as a principal risk or uncertainty facing the company. Fossil fuel producers are amongst the companies most exposed to the physical and transition risks associated with climate change. On this basis, the 38 companies considered should by now be making reference to climate risk when reporting on their principal risks and uncertainties in their strategic reports, and it is a breach of this disclosure requirement for them to fail to do so.[97] Consequently, the investment community is not provided with material information to make more informed decisions about capital allocation and to price risk or to assume a stewardship role by engaging in appropriate dialogue with boards.

Despite what appears a low overall compliance intensity, 22 of the 60 companies considered did identify and discuss climate change as a material risk, despite sometimes wide fluctuation in the disclosure quality between the strategic reports considered. First and foremost, 10 of the 22 companies, each with a premium or main market listing, produced the most extensive disclosure of material risks of climate change to financial performance and prospects. Perhaps unsurprisingly, this is likely because entities in this sub-sample are oil and gas majors that have been challenged for some time now by investors and society on their exposure to climate risk. These companies tend to outline the board's oversight and/or organisational processes for identifying, assessing and managing climate-related risks.[98] Similarly, there is in general a consistent and comparable narrative of management's expectations and assumptions, which involve the identification of known and unknown climate-related risks and uncertainties, a description of the particular mechanism used to mitigate or help identify that risk, and the specific outcome of such risk mitigation.[99] We found specific and relevant use of multiple severe, but possible, adverse

[95] Ibid., para. 5.9.

[96] In Sir Jonathan Thompson's (CEO of the FRC) November 2020 letter to CEOs, CFOs and Audit Committee Chairs, he stressed that '[u]sers expect companies to provide full information about the future impact of climate change on the business and how the company's activities affect the environment.' See FRC (2020c).

[97] CA 2006, s 414C(2)(b).

[98] See, e.g., BP, Annual Report and Accounts 2019, pp 68-69; Nostrum Oil & Gas, Annual Report and Accounts 2019, pp 13, 43–44.

[99] See, e.g., Royal Dutch Shell, Annual Report and Accounts 2019, p 29; and Cairn Energy, Annual Report and Accounts 2019, p 42. One notable exception is Energean, Annual Report and Accounts 2019, pp 70–74. Energean, being one of the largest premium listed carbon majors in the total sample, chose to limit its disclosure to regulatory risk and threats of environmental activism.

scenarios.[100] For example, this included a 2 °C or lower scenario, with appropriate cautionary language around associated limitations or uncertainties, which could threaten the company's viability, in order to assess the resilience of its strategy.[101] Moreover, there is evidence of an associated trend towards these larger quoted carbon majors' increased spending, if modestly, on diversified renewable energy projects at the expense of conventional oil and gas assets, despite the latter having apparently higher investment returns. This is likely driven by a combination of factors, including the price increase in the European Union Emissions Allowances and the growing focus among the financial community on increasing capital allocation to green projects.[102] Additional factors include momentum created by the implementation of European Union Directive 2014/95 on non-financial and diversity information. The implementation of this Directive requires listed companies to include ESG information in their corporate reports.[103] Notwithstanding, many explanations of climate change and its associated risks in this sub-sample were framed in generic or standardised terms, which, though conducive to consistency and comparability, did not specify the location of companies' operations or assets at risk. There was also a lack of substance as to how some of the risks connected to the company's specific business model and strategy. A further common weakness of disclosures in this sub-sample is a low occurrence of metrics and targets used to assess climate-related risks or net-zero commitments in line with organisational strategy and risk management processes. These are key focus areas for investors.

Turning to the sometimes wide fluctuation in the disclosure quality between strategic reports, two substantive observations can be made. First, we found that 12 of the 22 principally AIM companies that do report climate-related risks simply sketch out one or two brief paragraphs in the core business information and risks sections of the strategic report. Of this number of companies that formulate high-level or 'boilerplate' disclosures, six stop short of referencing climate change elsewhere in the annual report.[104] The six remaining companies do add satisfying information in non-mandatory components of the annual report. For example, Cairn Energy, the only company with a main market listing in this sub-sample, includes a bullet point list in a principal risks section of its strategic report, which identifies the

[100] Scenario analysis reflects the current or future impact of climate change on their financial position, for example, in the valuation of their assets, assumptions used in impairment testing, depreciation rates, decommissioning, restoration and other similar liabilities and financial risk disclosures.

[101] See, e.g., Tullow Oil, Annual Report and Accounts 2019, pp 17 and 28.

[102] On this point, see European Environment Agency (2019). See also BlackRock (2021), p 6.

[103] CA 2006, s 414CA. See also, FCA, Disclosure and Transparency Rules, paras. 4.1.5 and 4.1.8R, which stipulate that the annual report must contain a number of elements, including a management report that provides 'a description of the principal risks and uncertainties facing the [company]'; The Corporate Governance Code 2018, Provision 5, which applies on a 'comply or explain' basis, recommends that in-scope companies must provide specific information on the discharge of the section 172 duty in annual reports. Provision 28 of the Code also instructs boards to conduct 'a robust assessment of the company's emerging and principal risks'. Such risks are defined as 'events or circumstances that might threaten the company's business model, future performance, solvency or liquidity and reputation.'

[104] See, e.g., Enwell Energy, Annual Report and Accounts 2019, p 30; Coro Energy, Annual Report and Accounts 2019, p 16 (both AIM companies).

multidimensional *risks* of climate change and a transition to lower-carbon sources of energy.[105] However, a section entitled 'Climate Change Policy and Energy Transition' offers highly detailed and purposive attention to the company's *management and mitigation* of climate change at both strategic and operational levels of the business.[106] In the main, companies in this sub-sample that rely on non-mandatory components to augment undeveloped disclosure content in the strategic report typically limit remarks to vague and aspirational commitments to mitigate climate change threats in an introductory 'Chairman's Statement' and/or 'CEO's Review'.[107] The second significant observation on the uneven disclosure quality between strategic reports relates to the company's understanding and/or depiction of climate risks to its business operations. Specifying, the strategic report of seven of the 12 strategic reports frame future regulation and policy responses to climate change as the *only* material risk to the company's business operations and make no reference to the other physical and transitional threats of climate change. Six of the seven companies are AIM listed while the seventh is included in the main market segment.[108] Regulatory risk is relevant information. However, it is a basic fact that companies and their directors are likely to face far greater liability exposure if they fail to assess and, where material, disclose meaningfully *all* financial risks associated with climate change for the company (i.e., physical and transition risks) so that investors can adequately factor these considerations into investment decisions.

4.2 The Company's Impact on Climate Change and/or the Environment

Recall that UK law requires a director of a company to promote the success of the company, in good faith, for the benefit of its shareholders, and in doing so, have regard to, amongst other matters, *the impact of the company's operations on the environment*.[109] Climate impacts would seem to fall squarely within this definition. Following concerns that boards were insufficiently responsive to their responsibilities towards non-shareholder corporate constituencies, section 172 statements were introduced, under secondary legislation,[110] to strengthen the link between the purpose of the strategic report and the section 172 duty. Properly understood, this specific disclosure requirement should articulate how the board has had regard to broader matters, which, for present purposes, means the climate change-related impacts of the company on the environment and society. Whilst there is no set structure for the statement, guidance on what may need to be included to meet the CA 2006 requirement is available in the FRC's Guidance on the Strategic Report. In

[105] Cairn Energy, Annual Report and Accounts 2019, p 39.
[106] Ibid., p 46.
[107] See, e.g., President Energy, Annual Report and Accounts 2019, p 4; Rockhopper, Annual Report and Accounts 2019, p 13.
[108] See, e.g., Borders and Southern Petroleum, Annual Report and Accounts 2019, p 6; Cadogan Petroleum, Annual Report and Accounts 2019, p 11.
[109] CA 2006, s 172(1)(d).
[110] The Companies (Miscellaneous Reporting) Regulations 2018.

applying the Guidance, the same focus and approach to materiality is required as for the rest of the strategic report. That should mean that statements focus on the strategically important stakeholder relationships on which each part of the business is dependent and the impacts that the business has on each of those groups.[111] On this basis, we found that 49 of the 60 fossil fuel producers considered had included a substantive section 172 statement. Eight of the 11 non-reporting companies were not required to do so due to an exemption for qualifying medium-sized entities.[112] Moreover, six of the 49 companies made some clear reference to climate change within a broader discussion of environmental impacts and policies. Another 20 companies deployed the statement itself as principally a confirmation that s 172 had been considered, with mixed discussion of climate change impacts being provided in other sections of the annual report (particularly business model, strategy, culture and governance). The remaining 23 companies did not cite climate change (or anything similar) anywhere in the annual report and accounts. This latter result is, perhaps, quite surprising: despite the relative novelty of the section 172 statement, corporate disclosure on climate change information has traditionally, if voluntarily, focused on reporting company impacts on the environment and/or climate change, and it can scarcely be regarded as a new concept unfamiliar to the marketplace.

Our analysis of the six section 172 statements that expressly describe how climate change is considered suggests that FTSE 100 and, to a lesser extent, FTSE 250 companies are more likely to disclose climate-related impacts and policies than their AIM counterparts. This understanding of listing status 'discipline' may be useful to market predictions but it is not determinative. When we consider this sub-group relative to the total number of section 172 statements, it becomes clear that FTSE 100 companies consistently disclose the most climate change-related information and provide much richer detail than companies in the FTSE 250.[113] This is intuitive if we think of the enhanced legal-regulatory mixture and the critical mass of investors and investment intermediaries that articulate a powerful restraining influence on the purpose, values and priority matrix of companies with premium listing status. For example, BP was the only company to provide a detailed section 172 statement, which, similar to most other disclosures in this small sub-sample, cross-references other content in the annual report.[114] Reflecting the FRC's Guidance, however, BP's disclosure retains in-depth discussion of the climate-related matters that the board considers relevant to section 172 and articulates principal decisions about these matters.[115] Also included is a detailed description of the board's actions in relation to impacts on climate change, including identification of duty-based issues and factors, its engagement process, and divestment plans to fulfil its ambitions for the

[111] FRC (2018), para. 8.16.

[112] CA 2006, s 465. But see n 28 for doubt over this interpretation.

[113] Although three FTSE 250 constituents in our sub-sample—Cairn Energy, Energean and Tullow Oil—discuss climate change in a section 172 statement, there are eight of 49 companies of this listing type that do not mention the term 'climate' (or anything similar) in this context.

[114] On the importance of avoiding repetition, see FRC (2018), para. 8.5.

[115] Ibid., para. 8.23.

energy transition.[116] In contrast, FTSE 250 companies often combined stakeholder engagement and section 172 information, typically leading to the impoverishment of certain aspects of the required disclosure, particularly those not related directly to stakeholder engagement, e.g., the impact of the company's operations on climate change.[117] Indeed, a clear matter from the data patterns of this small proportion of disclosures is that descriptions of how the board considered climate-related factors in its actions, behaviours and decisions are only cursory and strategies for their control are very general.[118]

Moving on, a total of 20 of the 49 companies include section 172 statements; five have a main market listing while the other 15 are AIM companies. Yet all companies in this sub-group position climate-related information satisfying this disclosure requirement, without clear cross-references, in another component of the annual report.[119] This is a problematic omission given that the FRC's Guidance on the Strategic Report instructs companies to 'incorporate information into the Section 172 statement'[120] or, where necessary, in 'the directors' report by cross-reference to avoid duplication'.[121] Instead, companies in this sub-group typically situate climate change discussion in, for example, sections on 'Principal Risks',[122] 'Chair/CEO Statement',[123] or 'Sustainability Reporting'.[124] Many open questions and issues therefore remain about if and to what extent disclosures of this type meet the specific section 172 reporting requirement.[125] Read literally, the failure to include a complete statement pursuant to CA 2006, s 414CZA, would mean minimum legal requirements have not been met. Even leaving aside the obvious omission problem, we document in our dataset a strikingly similar empirical pattern of *less identifiable*, and significantly *lower quality*, discussion of the impacts of the company's business on climate change, relative to the requirements of the section 172 statement. Indeed, it is clear that (a) the likely consequences of any decision in the long-term, and (d) the impact of the company's operations on the environment, are by some margin not discussed as much as (b) the impact of the company's business on employees, and (c) the need to foster business relationships with suppliers, customers, and others.

[116] BP Annual Report and Accounts 2019, pp 66–67. See also FRC (2018), para. 8.11.

[117] On the importance of explaining how the board has had regard to broader section 172 matters, see FRC (2018), para. 8.10.

[118] See, e.g., Cairn Energy, Annual Report and Accounts 2019, pp 50-52. Although Cairn does, at the very least, clearly cross-reference information reported elsewhere in its annual report to meet this disclosure requirement.

[119] On the importance of cross-referencing of satisfying information, see FRC (2018), paras. 3.17–3.18.

[120] Ibid., para. 8.5.

[121] Ibid.

[122] See, e.g., Borders & Southern Petroleum, Cadogan Petroleum, Coro Energy, Echo Energy, Enwell Energy, Hurricane Energy, I3 Energy, Igas Energy, Independent Oil & Gas, Jkx Oil & Gas, Longboat Energy, Nostrum Oil & Gas, Pharos Energy, Premier Oil, President Energy, Sterling Energy.

[123] See, e.g., Diversified Gas, Enquest, Europa Oil & Gas, Igas Energy, Nostrum Oil & Gas, Pharos Energy, Premier Oil, President Energy, Quadrise Fuels, Trinity Exploration & Production.

[124] See, e.g., Enquest, Hurricane Energy, Igas Energy, Jkx Oil & Gas, Nostrum Oil & Gas, Pharos Energy, Premier Oil.

[125] CA 2006, s 414CZA.

A key effect or outcome of such partial and therefore inaccurate disclosure outside the section 172 component is that words and concepts of climate-related impact are far too vaguely defined and incomplete to be meaningful and to connect to everyday business activity and climate change, but are framed in terms that are sufficiently abstract and aspirational enough to inspire.

Consider first and in this regard President Energy, which notes in the Chairperson's Statement:

> President acknowledges and takes due regard to the increasing emphasis on climate change around the world. As we move towards a lower carbon future, President intends to explore ways of encouraging and supporting initiatives in this important area and will consider developing into a broader energy business taking into account the future needs of the planet.[126]

There is only one other reference to climate change, and that is a rather anodyne acceptance of it as a material risk.[127] Other, of the many, examples from this subsample include Diversified Oil & Gas, which, in its Sustainability Report, purports to 'reduce the need for and impact of the development of new fields, thereby reducing the introduction of new sources of emissions into the environment.' Such 'environmentally friendly business practices' are substantiated by a strategy to

> take mature, primarily natural gas-producing assets and improve [their efficiency and environmental performance through infrastructure upgrades], making them more sustainable, more productive and safer, until the end of their full economic lives.[128]

Notably, this high-level focus on mitigation elides more granular explanation of the actual residual impact of the company's activities on the climate. Second, while the section 172 duty stipulates regard to the 'impact of the company's operations on the community and the environment',[129] a significant number of disclosures focus *only* on material risks of climate change to the company's business in favour of required information about the impact of an entity's activities on climate change.[130] This weighted risk focus may be attributable to the perceived need for investors to understand and manage climate-related financial risks and opportunities, to which the company's impacts on climate change are conceptualised as less decision-useful. But clearly, how a company generates or preserves value over the longer term is dependent on considering the external impact of the company's activities on climate change. Without this material information it would be impossible for investors to assess the judgment and process of boards pursuant to the section 172 duty. Third,

[126] President Energy, Annual Report and Accounts 2019, p 4.

[127] Ibid., pp 4 and 10.

[128] Diversified Oil & Gas, Annual Report and Accounts 2019, p 78. Similar discussion is included in a CEO's Statement on p 10.

[129] CA 2006, s 172(1)(d).

[130] See, e.g., Enwell Energy, Annual Report and Accounts 2019, p 30; Sterling Energy, Annual Report and Accounts 2019, p 18.

and relatedly, the FRC's Guidance makes clear that the section 172 statement should focus on matters that are of strategic importance to the company.[131] However, disclosures related to environmental policy, management and performance are more often linked to a concept of CSR rather than being an integral part of the core management and financial performance of the business. That is, companies reporting on, for example, effective water management in the UK without commenting on the much more severe impacts of their supply chain on rainforests subverts the importance of materiality to the marketplace. Overall, this part of our generalised results indicates a potentially significant gap in coverage and consistency of disclosure requirements for a large portion of listed companies in a sector that is likely to be responsible for more significant climate change-related impacts.

4.3 GHG Emissions Disclosure

The UK government has legislated for net-zero greenhouse gas emissions by 2050. Given this direction, clear legal requirements now instruct quoted companies to disclose total global energy use, energy efficiency action and the methodology used to calculate the disclosure requirements.[132] Our content analysis of this part finds first that 11 of 13 in-scope companies considered disclosed the annual quantity of emissions, in carbon dioxide equivalent, from actions for which they are responsible.[133] This is an important result, as it indicates that a substantial majority of in-scope companies present information satisfying the disclosure obligation. However, there are inherent limits on the accuracy of these data. A close reading reveals that many companies use distinct countervailing methodologies,[134] which may organise and structure differently the various GHG gases to calculate their emissions.[135] Others are not entirely transparent about the methodology they have used or any exclusions that they have applied in their calculations.[136] This makes it difficult to assess in a consistent and comparable way company emission reduction targets and progress,

[131] FRC (2018), para. 8.12.

[132] CA 2006, s 416(4).

[133] See BP, Cadogan Petroleum, Cairn Energy, Energean Oil & Gas, Enquest, Jkx Oil & Gas, Nostrum Oil & Gas, Pharos Energy, Premier Oil, Reabold Resources and Tullow Oil. Two further quoted companies, Curzon Energy and Pennpetro Energy, do not disclose information pursuant to this new regulatory requirement; in both cases, the reason for non-disclosure is stated to be 'minimal' or 'sufficiently low' greenhouse gas emissions because of limited activity.

[134] Typical examples include: IPIECA/API/IOGP (2011); DEFRA (2019); GHG Protocol (2015); and GRI (2021).

[135] The Kyoto Protocol identifies seven GHG gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. See United Nations, Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998), Annex A, https://unfccc.int/resource/docs/convkp/kpeng.pdf (accessed 21 March 2022). For an example of highly selective calculation of emissions, see Pharos Energy, Annual Report and Accounts 2019, p 67, where only three GHG gases are included in the company's published emissions.

[136] See, e.g., Energean, Annual Report and Accounts 2019, p 45., stating only that 'calculations are verified by an independent accredited body'; Tullow Oil, Annual Report and Accounts 2019, p 28, presents qualifying 'Scope 1' and 'Scope 2' energy-related emissions, but there is no mention of methodology anywhere in its annual report.

and inadvertently advances the case for improvements and standardisation of methodologies. Secondly, and connected to the above, we find that 47 AIM companies do not present information satisfying this disclosure component.[137] This is, of course, hardly a surprise: the specific legal requirement excludes small/mid-sized companies whose equity share capital is not admitted to the official list of the UKLA. Even in the absence of a specific legal instruction, however, it is surprising that more AIM companies are not proactively and voluntarily disclosing this information to avoid important practical issues that put at risk their reputational capital and/or market valuation. It may well be that this sub-market of the LSE seems an inconspicuous, or even trivial, element of corporate life and capitalism, particularly once it has become accepted that investor-led attention to companies with a premium listing will be heavily weighted. But AIM is the largest junior stock exchange in the world, and institutional investors and especially venture capital trusts, entrenched in this vibrant market, commonly adopt governance mechanisms to reduce multi-layered agency problems.[138] Where a visible limit of the market to act is identified regardless of any failing or fault on its part, then a question mark is raised about the law's failure to fulfil its deferred function of directing small/mid-sized companies to align with the transition to a low-carbon economy or to meet the needs of shareholders.

5 Concluding Remarks

British companies currently have three main climate change disclosure responsibilities: a longstanding implicit requirement to list the principal risks and uncertainties they face, which for many companies will now include climate;[139] a duty under CA 2006, s 172, to report the impact of their activities on the environment;[140] and since April 2019, an explicit mandatory requirement for quoted entities to report energy use and carbon emissions.[141] Through a high-level review of 60 recent annual reports and accounts, we have analysed whether companies in the fossil fuel producers sector have disclosed information about climate change-related matters under the relevant legal requirement. The results, when combined, indicate in general that the vast majority of companies in the premium segment and the largest companies included in the standard main market disclose a clear and more than extremely limited reference to climate change in relation to the relevant legal requirements.[142] In contrast,

[137] For two examples of AIM companies that do include information satisfying this disclosure requirement in a sustainability report, see Diversified Oil & Gas and Hurricane Energy.

[138] Although the evidence suggests that AIM companies are owned to a greater extent by individual shareholders, it is important to note that pension funds, unit trusts and other financial institutions comprise a higher percentage of beneficial holdings relative to ownership of quoted companies. On this point, see ONS (2020), p 5.

[139] CA 2006, s 414(C)(b).

[140] CA 2006, s 414CZA.

[141] CA 2006, s 416(4).

[142] To ensure comparative analysis of different types of company, provisions that apply only to quoted companies are excluded from this particular result. This is because only a small number of companies

there is a positive association between AIM listed entities and disclosures where no reference to climate change, as a matter of law, has been identified, or a reference to climate change may have been identified but it is unclear or only extremely limited. Now there is one respect in which, when this connection is viewed in isolation, it becomes useful in providing a broad impression of disclosure practices and trends depending on the type of entity. However, when reflecting on the adequacy or materiality of climate change content within all disclosures, it appears that their concept of climate change tends to be far too vaguely defined, and their discussions of it too two-dimensional, irrespective of the type of entity and its market capitalisation. This is perhaps a surprising result.

In principle, the content elements of the strategic report instruct disclosure of material financial and non-financial information that is necessary for an understanding of the development, performance, position or future prospects of the company. This will generally include a description of a company's principal risks and uncertainties relating to climate change, and the impact or interdependencies of its business activities on climate change. To return to our generalised results, only 22 of 60 companies considered discuss the risks they face from climate change. These disclosures often lack substance, rigour and specificity in respect to the physical and transitional risks associated with climate change, and fail to provide forward-looking metrics against which risks can be quantified properly in the marketplace. Similarly, far fewer—six of 49—in-scope companies mentioned climate change in a substantive section 172 statement that applies to the strategic report. Information in this impact-relevant context, taken as a whole, is less developed and complete than discussion of the risks and uncertainties that climate change poses to the company. Most obviously, stakeholder engagement and section 172 disclosures were often combined, sometimes leading to the omission of certain obligations not directly related to stakeholder engagement, e.g., details of specific business relationships, products and services that are likely to cause adverse climate change impacts. In sum, the overall results provide cause for concern. Disclosure is often predicated on the organising idea that it embeds indirect procedural regulation, which compels companies to release information so that further action can be taken by interested participants, whether they be the market that provides necessary economic discipline or non-market constituents who may exert a restraining influence on behavioural change. If this theory is correct, then a question mark is raised about why climate-related disclosure regulation, taken as a whole, apparently fails at its function of potentially securing behavioural change on the part of most fossil fuel producers in our sample considered. Three distinct explanations may provide a possible answer with validity for all types of company.

The first account of inadequate disclosure quality accepts the premise that capital markets value robust climate-related disclosure and incorporate the disclosure records of investee companies into investment decisions, board engagement, proxy voting, etc. In so doing, this market judgment is sufficiently clear and durable

Footnote 142 (continued)
whose shares are not quoted on the official list of the UKLA presented information satisfying CA 2006, ss 414CA and 416(4).

enough to facilitate a restraining influence in the boardroom. However, in exercising managerial authority boards choose to neglect that market instruction or attach very little significance to it in their decisions and actions. This raises the question of why boards might elect this outcome. A weak case can be made that boards have robustly considered the principal risks or impacts associated with climate change and concluded that such matters are not material information. But doubt is readily cast upon this interpretation. Companies operating in this sector are highly exposed to climate change and its associated risks, and, simultaneously, portend the most significant impacts on climate change. Furthermore, if climate risks or impacts are immaterial to a company, it would be commercially advantageous to disclose this conclusion. The stronger position is that the board has failed to consider adequately the material risks or impacts associated with climate change, or the board has assessed climate risk or impacts but has chosen not to disclose the assessment because the results are not commercially advantageous. When private governance arrangements are broken, academics or policymakers instinctively seek to directly resolve the identified failings through public regulatory intervention.[143] In this regard, rather than wait for a common international climate-related disclosure standard, the introduction of the TCFD recommendations into UK law, *if supported by clear, non-negotiable 'red lines' and applicable to small/mid-sized firms*,[144] could facilitate the promotion of disclosure quality and more effectively influence behavioural change.[145] Yet we need to be cognisant of the limits of conventional legal-regulatory strategies based on the ability of such requirements to correct market failures in information-gathering processes and a lack of monitoring and enforcement capabilities in current regulatory practices around the world.

A second explanation relies on the same starting point that capital markets insist on the provision of robust climate-related disclosure and incorporate the disclosure records of investee companies into investment decisions. But contrarily, it may be the case that this transmission of information down the investment chain in practice stops short of a perfect and undistorted expression of investor disclosure needs in this regard and amounts instead to an increase in the amount and volume of 'noise' in the otherwise conscientious and responsive boardroom. That is, if boards are working to manage and contain the complex mixture of risks and impacts associated

[143] The classic statement of the case for a mandatory disclosure system based on market failures is provided in Coffee (1984).

[144] It is outside the scope of this article to suggest specific 'Paris-alignment' policy options for ensuring that rules are credible in the sense of being set within a system that contains enough incentives and deterrents to deliver adequate levels of full and frank disclosure. For an excellent starting point in this regard, see ClientEarth (2020), p 3.

[145] TCFD (2017). In the 2019 Green Finance Strategy the government established a Green Finance Taskforce, chaired by Her Majesty's Treasury and made up of regulators and government departments, to explore the most effective approach to implementing the recommendations of the TCFD. For accounting periods beginning on or after 1 January 2021, companies with a UK premium listing must include a statement in their annual financial report setting out whether they have made disclosures consistent with TCFD recommendations. The Department for Business, Energy and Industrial Strategy is currently consulting on how and when to extend climate-related disclosure obligations to other companies in the UK (including standard listed companies, AIM companies and large private limited companies). So, the expectation is that TCFD disclosures will, over time, become mandatory for more companies in the UK.

with climate change relative to the particular legal requirements, but investors and other market participants, in some sense, cannot evaluate easily the probabilistic significance of the 'insurance measures' that boards adopt, then it may lead to the benefits of this insurance becoming artificially, and inappropriately, undervalued within the market.[146] On this basis, there is some concern that competing managerial performance incentives, such as share-based remuneration structures and short-term managerial tenure,[147] will create many distortions of their own and ultimately lead to the board's underinvestment, either expressly or impliedly, in these insurance measures. If this understanding is correct, the actual function of a disclosure regime may diverge from the subsequent life and effects of a regime. This can reduce its socially progressive effects, which will ultimately inhibit the transition to a low-carbon economy (and, in the long run, facilitate beneficial effects on the company's achievement of its objectives)[148] and make fossil fuel producers more accountable generally for their actions.[149] In sum, this explanation illustrates in extreme form the problems of imperfect information and incentive misalignment in equity markets, to which reform-oriented solutions of the type discussed in our first scenario may seem appropriate.

Now we turn to a third account of the underlying reasons behind uneven disclosure quality in our sample of companies considered. It is axiomatic that more traditional financial disclosure rules increase the accuracy of prices and promote liquidity, and that shorter periods in which shares are held lead to more frequent trading.[150] Since the benefits of liquidity and efficiency are enjoyed after each trade, investors who trade more frequently derive more value from financial disclosure content of this type.[151] In contrast, the role of modern financial disclosure that is conceptualised within a public interest framing may be far more limited, and far less straightforward, than is typically assumed. Those limits reflect the complexity of human decision-making. That is, whatever the Paris-alignment rhetoric within the market may be, it is not clear whether investors' stated *modus operandi* mirrors their actual investment actions. While climate change disclosure rules should (at least theoretically) sufficiently motivate more responsible decisions, other more visible factors may be far more important to understanding the company's immediate and obvious financial position. Perhaps nowhere is this more clearly reflected than in the circumstances and events that culminated in the recent global financial crisis.[152] Executive remuneration disclosure is another example where enhanced information

[146] For an example of how high information costs and low salience of information can lead market participants to overlook valuable trading opportunities, see, e.g., Bartlett III (2010), p 57. See also Kay (2012), pp 35–36.

[147] Kay (2012), p 45, stating that attempts to align the interests of boards and shareholders have in practice become 'a principal source of friction between them'.

[148] Choudhury and Petrin (2018), p 402.

[149] Villiers (2006), pp 232–233.

[150] Georgakopoulos (2017), p 75.

[151] Ibid., p 73.

[152] See, e.g., Bartlett III (2010), p 57.

apparently has not prompted investor-led governance, but appears to have the opposite effect of prompting action by peer CEOs – to exert pressure on their boards to raise their pay.[153] If this 'jam today' behaviour within the marketplace is transmitted without distortion down the investment chain so that, once identified, boards align with the 'irrational' self-interest of the underlying beneficiaries, it is tempting to see such incentive distortion as the cause of the under-weighted quality of climate change disclosure.[154] This explanation does not argue for making considerably less use of disclosure, nor does it argue against disclosure generally. But it does sound some cautionary notes about its 'disinfecting' effects of aligning institutional climate finance. In doing so, it implies the importance of mandatory disclosure of quantified exposure to climate-related financial risks and impacts identified in lending and other financial intermediary business activities.

In total, this article presents and analyses unique empirical research into the climate-related disclosure quality of British fossil fuel producers included in the FTSE All-Share Index. This empirical inquiry is undertaken to determine if and to what extent disclosure as a concept and policy goal achieves its self-identified function of managing the socio-economic risks and impacts of climate change. Simply put, the results do not exceed expectations that current disclosure regulation can ultimately support the transition to a low-carbon economy and make all companies in this sector more accountable generally for their actions. Notwithstanding, disclosure seems likely to remain a significant feature of UK company law as we look to the next decade and beyond. On this basis, the article's central analysis of the limits of climate-related disclosure in this context potentially contributes to transformative and systemic change, and challenges conventional wisdom by exploring alternative and creative insights that may explain those limits. Solutions are difficult to come by and as difficult, if not more difficult, to agree upon. A solution emphasising disclosure can give the appearance of 'doing something' when nobody can agree on anything else. However, disclosure is too often a convenient path for policymakers and many others looking to take action and affirm a too-comforting worldview in the face of a bad outcome. The limits of disclosure reveal once again the need for further research to be undertaken to provide a better understanding of the relationship between information processing and decision-making and, more broadly, for a more nuanced view of human nature that can better inform policy decisions.

Appendix

Anglo African Oil & Gas plc
Angus Energy plc
Ascent Resources plc
Baron Oil plc
Block Energy plc

[153] See, e.g., Dignam (2013).
[154] Carroll (1872).

Borders & Southern Petroleum plc
Bowleven plc
BP plc
Cadogan Petroleum plc
Cairn Energy plc
Caspian Sunrise plc
Clontarf Energy plc
Coro Energy plc
Curzon Energy plc
Diversified Oil & Gas plc
Echo Energy plc
Egdon Resources plc
Empyrean Energy plc
Energean plc
EnQuest plc
Enwell Energy plc
Europa Oil & Gas plc
Hurricane Energy plc
I3 Energy plc
IGas Energy plc
Independent Oil & Gas plc
Iofina plc
Jersey Oil & Gas plc
JKX Oil & Gas plc
Lansdowne Oil & Gas plc
Longboat Energy plc
Nostra Terra Oil & Gas plc
Nostrum Oil & Gas plc
Nu-Oil & Gas plc
Pantheon Resources plc
Parkmead Group plc
Pennpetro Energy plc
Pharos Energy plc
Phoenix Global Resources plc
Premier Oil plc
President Energy plc
Prospex Oil & Gas plc
Quadrise Fuels International plc
Reabold Resources plc
Rockhopper Exploration plc
Royal Dutch Shell plc
Savannah Energy plc
Scirocco Energy plc
Serica Energy plc
Sound Energy plc
Sterling Energy plc

Tower Resources Oil & Gas plc
Trinity Exploration and Production plc
Tullow Oil plc
UK Oil & Gas plc
Union Jack Oil plc
United Oil & Gas plc
Victoria Oil & Gas plc
Volga Gas plc
Zephyr Energy plc

Acknowledgements I am thankful to Eleanore Hickman, Mathias Siems and Jenifer Varzaly for reading earlier drafts of this article. The usual disclaimers apply.

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