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Early knowledge but delays in climate actions: An ecocide case against both transnational oil corporations and national governments

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ABSTRACT

Recent articles have demonstrated the knowledge and accuracy of oil corporations' predictions made since the 1950s on the effects of their products on the global environment. But can the early relationship between oil corporations and national governments and lack of climate actions by both actors count as ecocide? If so, should remedial strategies appeal to freer markets for oil or greater state regulation? Cast within the wide context of investigating the collusion at play between powerful political-economic actors and decision-makers as monopolists and debates about 'the modern corporation and private property' (Berle and Means, 1932/2017), 'the new industrial state' (Galbraith, 1967), and 'the economic theory of regulation' (Stigler, 1971), the paper reviews the contentious relationship between states, corporations, and markets. Specifically, the article probes strategies of oil corporations and national governments intended to delay the inclusion of environmental concerns in policies and avoid accountability. Our method of content analysis of articles, reports, and international declarations of different actors and periods relies on a qualitative methodology and ontology of critical realism. We find that not only did oil corporations hide the truth, but also that national governments, that knew (or should have known) about the threat posed by oil industrial activities and which have wider responsibilities than corporations, did not act and are (at least) as responsible and as 'ecocidal' in what could be called an oil TNC-state alliance. Accordingly, we open the avenues for redressing an evolutionary shift from markets and states to commons, and embedding power within communities (Polanyi, 1945) along with a more universal right to bring a case of ecocide against both transnational oil corporations and states that collude with them.

1. Introduction

Some of the classic debates in political economy have centered around the tensions and tumultuous relationship between the state, transnational corporations, markets, private property, and economic regulation. Economists and lawyers as well as other social scientists have dominated these debates which tend to be more economic, than ecological (see, for example, Berle and Means, 1932/2017; Galbraith, 1967; and Stigler, 1971).

Yet, there is a wealth of research on the strategies and public outputs produced by oil corporations and lobbies to discredit actors or documents demonstrating the greenhouse effect or climate change that can

be placed within these wider political-economic debates (Center for International Environmental Law, 2016; Franta, 2021; Jacques et al., 2008).

Transnational oil corporations provide one link to this ecological political economy. These corporations do not act alone, and still aside from the obvious responsibility of oil corporations, the role of an important type of actor in these controversies is often ignored. National leaders and governments, through a variety of sources, were aware of the coming environmental disaster central to the operations of oil transnational corporations. The first route of information is constituted by early warnings from many researchers, starting from Arrhenius (Arrhenius, 1896) and others on the use of fossil fuels (see Anderson

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et al., 2016 and Robinson and Robbins, 1968 for a summary). Second, governments could often rely on regular reports from scientists who were well-versed in the dangers of business-as-usual practices around fossil fuel activities (Callendar, 1938; Hansen et al., 1988; Hansen and Lebedeff, 1987; Rodhe et al., 1997; Suess, 1955). Thirdly, many major oil corporations were, at least partly, state-owned until the end of the 20th century or the beginning of the 21st century. Prominent examples include the British government, with more than 30 % shares in British Petroleum (also known as BP) until 1987 (Yergin, 2011; Los Angeles Times, 1987), the French government with shares in Total (now TotalEnergies) until 1992 (Polo and Fressoz, 1992), and the Italian government's continued share in ENI (ENI, 2024). In the following, we will concentrate especially on two European supermajors, Total and BP, and their owners, as the documents we analyze best cover their cases. However, note that since the first oil crisis in the 1970, the role of national oil corporations, such as Saudi Aramco (Saudi Arabia), Gazprom (Russia), China National Petroleum Corporation (China) and National Iranian Oil Company (Iran), has steadily risen (Auzanneau, 2018). These and other national corporations, such as Pemex (Mexico), PDVSA (Venezuela), Petronas (Malaysia) and Equinor (former Statoil, Norway), have operated in full view of their governments at the same time as the governments themselves have often been participants in international efforts in curbing climate change.

This means that not only did oil corporations know about the disastrous consequences of their activities (see e.g. Center for International Environmental Law, 2016; Franta, 2021; Jacques et al., 2008), but also national governments (of, often, producing and consuming countries, with shares in or relations with oil corporations since, at least, the 1970s) as major shareholders had knowledge about their activities through governments' members appointed as directors of public oil corporations (Kogan and Salganik-Shoshan, 2015). Even if a clear link between knowledge and directorship needs further research, other examples developed in this article illustrate an intricate relationship. In the current context of climate and environmental emergencies, this long knowledge spurred a new wave of legal cases and criticism on the strategies and lies employed by oil corporations since then (Milman, 2023; Palmer, 2023; Rannard, 2023; The Economist, 2022). Petroleum transnational corporations are increasingly sued for their lies and climate change responsibilities (Arkush and Braman, 2023; Kahn, 2023; McGreal, 2021). But national governments must also be held accountable for their support of oil corporations and for the long-standing gap between their public commitments to sustainable development and their knowledge of the situation on the one hand, and their actual actions on the other.

To illustrate the knowledge of both the corporations and their state or other owners, and their collaborative efforts to hide the truth, here we aim to answer the question: Can the early relationship between oil corporations and national governments and the lack of climate actions by both actors count as ecocide? The aim is to demonstrate that national governments, as shareholders and owners of oil corporations, are also responsible for oil corporations' strategies to deny global warming. By protecting each other's interests, they acted as one, displaying a collusion between those making the rules and those benefiting from them. The use of the concept of ecocide, developed below, aims at acknowledging the global or trans-national responsibility of oil corporations and national governments in the current environmental crisis by highlighting their long knowledge on the question and their lack of intervention. There is an absence of recognized and usable terms in international systems, during peace times, linking environmental and transnational destruction or change of natural environments on which people depend. This involvement and the important role of governments in protecting the oil industry have received less attention than the long-standing denial strategy of oil corporations. Yet, the consequences of this association are still impacting contemporary efforts to address the issue (Hauser, 2022).

The rest of this article is divided into four themes. *The understanding*

of ecocide and group responsibility provides the context – ecocide – to address the research question. *Methodology* provides the theory of method on which we rely to address the question. Oil corporations' public denial of their own knowledge is where we provide findings. Governments clarifies state complicity and collusion, while Discussion returns to the bigger questions about ecocide within and beyond this article.

2. Ecocide: Concept and Context

Ecocide is often asserted, but either narrowly defined or rarely systematically conceptualized. Take David Whyte's (2020, pp. 4–5) important work, *Ecocide: Kill the Corporation Before it Kills Us*. It conceptualizes ecocide only in terms of 'profit-making' and 'incorporated' firms when, in fact, corporations often seek control, not always profit-making. Corporations rarely act alone. They are often complicit with governments and other institutions like the military (Obeng-Odoom, 2022, p. 433). Indeed, even in mainstream economics often steeped in dualisms about 'markets' and 'states', as far back as 1971, George Stigler theorized that economic regulation by governments is purchased in the market. Economic regulation, according to Stigler (1971), is used to capture state interests. Of course, Stigler's contributions were preceded by Berle and Means (1932)/(2017) as well as Galbraith (1967) that questioned this binary and raised significant interest in the contested and nested relationship between the state, private property, transnational corporations, markets, and economic regulation. So it is important to make the framing of ecocide more comprehensive.

The 2021 independent expert panel published a definition and a list of the conditions that broadened the canvass to identify ecocide (Independent Expert Panel for the Legal Definition of Ecocide, 2021). The aim of this panel was to fill the gap and answer the limitations of the International Criminal Court's Rome Statute, where ecocide could be used only in international armed conflicts (Minkova, 2023). The definition of ecocide given by this panel, and used as a basis in this article, is "unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts." This definition serves as a pillar to determine whether the actions of oil corporations and national governments constitute ecocide or not. The panel further details the terms to prevent any vagueness, but we can conclude that the cumulative requirements constitutive of an ecocide are as follows: unlawful, severe; knowing or premeditated, and widespread or long-term. This is part of the wider issue of 'toxic crimes',² the focus of a research group at the University of Helsinki.

Responsibility for climate change has been attributed to many actors, including individuals, corporations and public entities, such as national governments (see, e.g., Grasso and Heede, 2023; Frumhoff et al., 2015; Nolt, 2011). A particular problem concerns collective responsibility. Individuals hold information and have some knowledge, but the identification of precise members or representatives of either oil corporations or national governments is particularly difficult if not impossible in lobbying groups or international conferences of different periods. As we do not have the space to delve deeper into the issue (see Hormio, 2024), we limit ourselves to considering executives of oil corporations and of national governments, as individuals representing organizations and public entities.³ The term oil corporations refers to, among others,

² <https://www.helsinki.fi/en/researchgroups/toxic-crimes/people>

³ Thus when we write that corporations or governments know this or that, we use these expressions as short-hand expressions of the proposition that individuals legally representing corporations or governments know this or that. This clarification does not mean to deny the possibility of collective epistemic agency, but to remain uncontroversial and specific in our claims of knowledge attribution.

transnational oil corporations, fossil fuel corporations, oil lobbies, representatives of oil corporations, or the oil industry as a whole. This group responsibility is not only linked to the fact that the oil lobby, as an entity, commissioned scientific investigations, but also to a document from Exxon detailing the “wide circulation” of the information the company held to Exxon management and personnel ([Exxon Research and Engineering Company, 1982](#)). The term national governments applies to governments or their representatives in oil corporations’ boards or European or international institutions.

When considering the knowledge of national governments through oil corporations, we use the understanding of the relationship between corporations and national governments developed by [Barkan \(2013\)](#). Even though there is, in general, information asymmetry between shareholders and the management team of the company, these two actors, namely the state as a major shareholder and oil management, are deeply interdependent in pursuing common interests. He develops the extent of this notion by highlighting that “corporate power and sovereign power are ontologically linked”, through, among others, the principle of “*legally sanctioned immunity from law*” which characterizes the constitutive relationship between corporations and political sovereignty ([Barkan, 2013](#), p. 4).⁴ The body of evidence on the industrial protection of governments since the beginning of industrial activities ([Le Roux, 2016](#)), and the participation of industrial actors in governments and decision-making processes, tend to confirm this *corporate sovereignty* and its alignment with imperialism for the security of oil supplies ([Altwater, 2006](#); [Auzanneau, 2018](#); [Yergin, 2011](#), p. 534). This article builds on this concept to detail the responsibility of both oil corporations and national governments in the contemporary climate and environmental crises, and to support claims of environmental and human crimes through the notion of ecocide.

3. Methods and methodology

Two questions need addressing. First, can the early relationship between oil corporations and national governments and the lack of climate actions by both actors count as ecocide? If so, second, should remedial strategies appeal to freer markets for oil or greater state regulation?

To address these questions, we drew on the methods and a related methodology of documents and its method of document collection and analysis. This method is relevant in the present case to suggest questions, situations, developments, changes, and findings ([Bowen, 2009](#)). Using this methodology, we aim at identifying these elements to understand the path constitution which created current lock-in situations through successive evolutions ([Sydow et al., 2012](#)), and where oil corporations and national governments, as knowledgeable agents, can be considered path creators and defenders ([Garud and Karnøe, 2001](#)).

First, the documents analyzed are oil corporations’ internal and public documents, internal scientific reports and public communication documents published since the 1950s. The availability and analysis of oil documents predating the environmentalism movement of the 1970s are of paramount importance to reveal the extent of the oil industry’s knowledge. Second, we collected and analyzed publicly available texts such as scientific publications and international declarations or treaties discussing environmental protection, greenhouse gas emissions, or the climate. These independent scientific publications or documents from international institutions were selected for their importance in the understanding of CO₂ and the climate, the role of oil corporations, and the development of environmental protection rules. The relevance of document analysis lies in putting oil documents and their timeline in parallel with the timeline and content of independent scientific articles, as well as international reports and declarations from international

⁴ Although Joshua Barkan in his book *Corporate Sovereignty* mainly takes Anglo-American corporations and systems as a background, we align with his conception of corporate power.

summits, all published since the end of the Second World War. This analysis is further completed by up-to-date publications on the subject. The objective is to highlight the lack of translation of independent scientific warnings into regulations and binding objectives. [Table 1](#) briefly summarizes the main documents used in the document analysis.

[Table 1](#) is not exhaustive. There are other documents worthy of analysis. Examples are the US National Academy of Sciences (1977: *Energy and Climate*; 1979: *Carbon Dioxide and Climate*; 1983: *Changing Climate*), and President Johnson’s Science Advisory Committee report, 1965, etc. Also Shell’s 1991 video: *Climate of Concern*. Yet, the documents analyzed in [Table 1](#) are adequate to address the research questions.

4. Results: (a) Oil corporations’ public denial of their own knowledge

4.1. Perspectives from internal reports

Many of the internal documents analyzed were only recently unearthed ([Center for International Environmental Law, n.d.](#); [Climate Investigations Center, 2014b, 2014a](#)), with many elements newly discovered ([Supran et al., 2023](#)). Exxon’s memo of 1982 on “CO₂ “Greenhouse” effect” ([Exxon Research and Engineering Company, 1982](#)), or Shell’s report of 1988 “The Greenhouse Effect” ([Jacobs et al., 1988](#)), stood as the most prominent evidence of early and wide knowledge of the corporations and their management teams. However, recent documents from the oil lobby, particularly of the American Petroleum Institute, one of the most powerful oil lobbying groups, highlighted a deeper and much earlier knowledge of the oil industry than previously believed ([Center for International Environmental Law, n.d.](#); [Climate Investigations Center, 2014b](#)).

An article published by Brannon et al. for ExxonMobil in 1957 (at the time called Humble Oil) demonstrates that the company was aware of the climate risks caused by its activity way earlier than the 1970s ([Brannon et al., 1957](#)). The authors of this paper were already referring to the carbon dioxide added into the atmosphere from the combustion of fossil fuels. In another report from 1968, this time for the American Petroleum Institute, Robinson and Robbins were far clearer on the climate and environmental changes caused by an increasing concentration of atmospheric carbon dioxide. The authors explained that:

Significant temperature changes are almost certain to occur by the year 2000 and these could bring about climate change. [...] It is clear that we are unsure as to what our long-lived pollutants are doing to our environment; however, there seems to be no doubt that the potential damage to our environment could be severe ([Robinson and Robbins, 1968](#), p. 109–110).

The content of these two articles already fulfills all the constitutive requirements of ecocide mentioned in the previous section. The long-term consequences and the severity of the changes brought by climate change are clearly laid out. The authors even explain that papers published by Chamberlin and Arrhenius, respectively in 1899 and 1903,⁵ were already independently suggesting the impact of carbon dioxide on the climate ([Arrhenius, 1896](#); [Chamberlin, 1899](#)). Thus, not only was the theory out but it was regularly confirmed by scientists commissioned by petroleum corporations and lobbying groups before the emergence, in the 1970s, of an international environmental movement. This disregard for early warnings, later developed through the public communications of oil corporations, already fits the definition of “wanton”, and completes the list of conditions created by the independent expert panel for ecocide.

⁵ The authors mention a work from Arrhenius in 1903 without referencing his work. However, a more acknowledged work of Arrhenius on carbon dioxide was published in 1896, thus predating Chamberlin’s.

Table 1
Main documents of the analysis.

Origin	Title of the document	Relevance
Industry	Brannon Jr, H. R., Daughtry, A. C., Perry, D., Whitaker, W. W., & Williams, M. (1957). Radiocarbon evidence on the dilution of atmospheric and oceanic carbon by carbon from fossil fuels. <i>Eos, Transactions American Geophysical Union</i> , 38(5), 643–650.	A paper published by scientists with the Humble Oil (later part of ExxonMobil) Production Research Division which points out “the enormous quantity of carbon dioxide which has been introduced in the atmosphere” and links it to the combustion of fossil fuels.
	Robinson, E., & Robbins, R. C. (1968). <i>Sources, abundance, and fate of gaseous atmospheric pollutants. Final report and supplement</i> . Stanford Research Institute, Menlo Park, CA.	A paper prepared for the American Petroleum Institute (API) linking CO2 emissions and climatic changes observable by the year 2000.
	National Petroleum Council. (1972). <i>Environmental Conservation - The Oil and Gas Industries Volume Two</i> .	A report from the National Petroleum Council dismissing the origin of the increase in CO2 concentrations and its seriousness.
	Keitz, E., & Berks, D. (Eds.). (1976). <i>Living with climatic change: Phase II</i> . The MITRE Corporation.	A report revealing the knowledge of American industrial leaders about climate change and their opposition to regulatory constraints to tackle it.
International or European declarations, reports, or treaties	Exxon Research and Engineering Company. (1982). <i>Memo to Exxon Management about CO2 “Greenhouse” Effect</i> .	An Exxon report summarizing the “CO2 “Greenhouse” Effect” report for Exxon’s management, and the irreversible impacts it could have. (The report appears in memos already in 1980 but was not widely shared within the company before 1982).
	Jacobs, R. P. W. M., Griffiths, M. H., Bright, P. E., Homer, J. B., van Oudenhoven, J. A. C. M., & Waller, J. (1988). <i>The Greenhouse Effect</i> . Shell Internationale Petroleum Maatschappij B.V.	A Shell confidential report highlighting the knowledge of the company on the effects of its products, and the fact that once global warming will be detectable it could be too late to act.
	The United Nations. (1972). <i>Declaration on the Human Environment</i> .	Declaration of the United Nations on the first world conference on the environment and creating principles for environmental protection.
	The World Commission on Environment and Development (1987). <i>Our common future</i> .	Also called the Brundtland report, it defines sustainable development while linking global warming from CO2 emissions to terrible consequences.
Scientific publications	The European Communities. (1987). Single European Act. <i>Official Journal of the European Communities</i> .	This European Act introduces, among others, a common environmental policy to protect the environment and human health.
	The United Nations. (1992). <i>Rio Declaration on Environment and Development</i> . United Nations General Assembly.	This declaration follows the third world conference on the environment and updates the principles set during the Stockholm conference, linking economic progress to environmental protection.
	Arrhenius, S. (1896). XXXI. On the influence of carbonic acid in the air upon the temperature of the ground. <i>The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science</i> , 41(251), 237–276.	One of the earliest acknowledged publications on the potential impacts of increasing CO2 concentrations in the atmosphere on the climate.
	Callendar, G. S. (1938). The artificial production of carbon dioxide and its influence on temperature. <i>Quarterly Journal of the Royal Meteorological Society</i> , 64(275), 223–240.	Callendar pointed out the increasing concentration of CO2 in the atmosphere, linking it to the industrial revolution and the slow capture of CO2 by the oceans.
Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). <i>The limits to growth: a report for the club of Rome’s project on the predicament of mankind</i> . New American Library.	A book for the Club of Rome which highlights how population and economic growth, in 1972, were unsustainable for the natural system of the Earth.	
Supran, G., Rahmstorf, S., & Oreskes, N. (2023). Assessing ExxonMobil’s global warming projections. <i>Science (New York, N.Y.)</i> , 379(6628).	A recent publication which reveals the accuracy of ExxonMobil’s early predictions on global warming.	

Table 2

Examples of delays between climate change knowledge and legal commitments of nations to tackle CO₂ emissions.

State	Owning shares until at least 1990 in:	Year the company knew	Year the State implemented CO ₂ tax
France	Total	API member at the time of the first reports in 1960s.	Proposed in 2000, implemented in 2014 (Rocamora, 2017)
United Kingdom	British Petroleum	API membership unclear, but CEO of BP was chairman of the API in 1988. Lawsuits from Attorney General for the District of Columbia claims BP knew through API since the 1950s (Office of the Attorney General for the District of Columbia, 2020).	2013 (Abrell et al., 2019)
Norway	Statoil	Executives knew in 1980 along with other major oil corporations (Nissen, 2021).	1991 (Norwegian Ministry of the Environment, 2005)
Italy	ENI	Eni's Isvet research centre warned the company in 1970 (Levantesi and Franta, 2023).	No carbon tax yet implemented, only an environmental tax in 1999 (Distefano and D'Alessandro, 2023).

4.2. Information publicly communicated

In 1972, the National Petroleum Council (NPC)⁶ published a report entitled “Environmental Conservation – The Oil and Gas Industries. Volume Two”.⁷ This report is important for multiple reasons: it comes only a few years after Robinson’s report; it is published the same year as the Club of Rome’s famous report “The Limits to Growth” (Meadows et al., 1972); and the year of the first Earth Summit in Stockholm. The timing of this publication allows for an analysis of the position of the oil lobby at the time of clear warnings and at the beginning of an international awareness of the need to preserve natural environments.

Although informed of the global effects of its activity, the oil lobby vehemently opposed the emerging environmental concern and its arguments. Despite the explicit warnings made in “The Limits to Growth” in 1972, and Robinson’s article in 1968, the NPC rejected the results. The justification exemplified an early practice of the notion of weak sustainability (Gutés, 1996; Pearce and Atkinson, 1993):

Despite the environmental damage that has already occurred, there is no agreed authoritative opinion that irreparable harm has been done. To the contrary and notwithstanding the gloomy forecasts of some observers, there is every reason to believe that a coordinated approach on an international basis with properly selected priorities will achieve that conversation of our earth space environment required to buttress a steadily improving quality of life. A continuing and steadily improving life quality does not and indeed cannot imply a return to some earlier pastoral era or back-to-nature movement. The maintenance of adequate environmental system rather implies an expanding economy that will generate the necessary resources and technology to harmonize the maintenance of that system within an improving life quality (National Petroleum Council, 1972, p.60).

In this report, the oil lobby dismisses the expertise of the scientists the corporations had mandated, as well as the recurring demonstrations of the potential damages caused by fossil fuels (Bonneuil et al., 2021). When mentioning Robinson’s report to discuss “reactive pollutants”, NPC’s document explains that their increase appears unlikely, while recognizing that, for unknown reasons, carbon dioxide concentrations “appear to be increasing”. Further on, it even emphasizes the global warming threat and its potential consequences (p.11). The NPC ends the paragraph by justifying the potential wrongs of their strategies in the name of a wider social good. This justification is in line with the strategy of “invisibilizing” the detrimental effects of fossil fuel extraction and use by externalizing or shifting the activities to other locations (Obeng-Odoom, 2018). This behavior is additional proof of the “reckless disregard for damage that could be clearly excessive” mentioned in the

⁶ An American committee whose aim is to “represent the views of the oil and natural gas industries in advising, informing, and making recommendations to the Secretary of Energy”. For more information, see: <https://www.npc.org/NPC909/background.html>

⁷ The Volume 1 makes no reference to the climate nor to carbon dioxide.

definition of “wanton” for ecocide.

Eventually, when presenting extracts from Volume I, the NPC elaborates on its perspective on environmental regulations and constraints. For instance, in the “Law and Regulatory Policy” section the NPC indirectly emphasizes the ignorance of public authorities around technical and economic considerations linked to industrial activities. Using this gap, it openly advocates for the freedom of industrial corporations to choose means through which they will achieve the standards fixed on the national level. In view of their historical and powerful lobbying activities, one can understand that through this document oil corporations are not only influencing policy-making processes through the creation of loose standards but also want to decide on their best application (Corporate Europe Observatory, 2017; Deneault, 2018; Frumhoff et al., 2015; Hauser, 2022; Laville, 2019a; Obeng-Odoom, 2014). The problem, beyond choosing the means to reach the objectives is that, following Barkan’s notion of “corporate sovereignty” and Mitchell’s explanation of the “carbon democracy”, oil corporations are also parties in the creation of these, often low or vague, objectives (Barkan, 2013; Mitchell, 2013).

4.3. A new and forced accountability

With the discovery of transnational oil corporations’ internal reports (Climate Investigations Center, 2014a, 2014b), and the numerous scientific articles pointing to the climate and health impacts of the oil industry (Eklund et al., 2019; Hauser and Aktürk, 2022; Hmiel et al., 2020; Johnston et al., 2019; Watts, 2020) (for a wider discussion see Lipsky, 2023), came a better-informed public, determined to hold oil corporations accountable for their damages. These documents and their analyses also proved their long knowledge, lack of actions, thus responsibility, for the effects of their industrial activity on the environment and the global climate.

People but also cities and national governments struggling to cope with the consequences of climate change are now suing oil corporations for their lies and inactions. The strategy is to directly associate the damages from heavy rains, storms, or sea level rise to petroleum activities. The damages caused by this ecocide are directly affecting communities, destroying natural systems on which they rely for their survival (Brisman and South, 2014; Higgins et al., 2013; Lynch et al., 2021; Mehta and Merz, 2015). Thus, ecocide should not only be considered a peacetime crime against nature but also against human lives and cultures. By delaying or suppressing scientific evidence and lobbying against regulations on environmental protection, corporations are accused of deliberately aggravating environmental crises (McGreal, 2021). As Arkush and Braman recently explained, deaths caused by these events should now lead to homicide prosecutions considering the deceitful conduct of petroleum corporations and their lobbies:

The case for homicide prosecutions is increasingly compelling. A steady growth in the information about what FFCs [Fossil Fuel Companies] knew and what they did with that knowledge is revealing a story of antisocial conduct generating lethal harm so extensive it

may soon become unparalleled in human history (Arkush and Bra-
man, 2023).

With the increasing amount and scale of climate change-related disasters, thus also of casualties, the reasoning is understandable. However, condemnations of oil corporations for homicide are unlikely to happen in the near future for various reasons. These include the impossibility of linking large-scale disasters to specific health impacts and an individual oil company, and the reliance of these prosecutions on the enactment and application of laws detrimental to this strategic sector. The recent rise of the notion of ecocide in United Nations discussions, also reported in a European Union draft proposal, is a less drastic but more applicable step forward (Report A9-0087/2023 from March 28, 2023), although its enforcement issues will probably remain, as will the protection of the oil sector by national governments.

5. Results (b) Governments knew (or should have known) as shareholders of major oil corporations

The Second World War intensified the alignment between industrial actors and national decision-makers, and this alignment persists today. In France, Total and Elf, two oil corporations that later merged into today's TotalEnergies, also knew about the effects of their products and activities on the environment. Total was a member of the API in the late 1960s and was advertising its awareness of climate science in its own magazine as early as 1971 (Bonneuil et al., 2021). For a long time, the French State had stakes in these corporations and was still holding at least 34 % of Total before selling its shares in 1992 (Polo and Fressoz, 1992). Similarly, the British government held a 31.5 % stake in British Petroleum until 1987 (Los Angeles Times, 1987). For the Italian oil company ENI, the Italian State still holds 32 % of the shares (ENI, 2023). Thus, before selling their shares, the governments were major shareholders of these transnational oil corporations at a time when these corporations had extensive knowledge of the effects of their activities on the climate. As major stakeholders, national governments had representatives in executive committees and boards of directors, and consequently access to relevant strategic information. This access already establishes moral accountability, independently of the question of what the stakeholders knew (or should have known) and did with the information.⁸ Note that in a connected context, that of upholding the well-being and equality of citizens in the face of climate change, the European Court of Human Rights has insisted on the governments' (in the *Klimaseniorinnen* case, Switzerland) responsibility for upholding human rights, including a "positive obligation" to prevent serious and irreversible adverse effects (Cohen et al., 2024). This obligation goes beyond what is expected from private corporations by law: according to human rights legislation, national governments have a "duty of care" with regard to threats to life and adverse effects on the home or private life (Leijten, 2019). Consequently, if a national government and a private company possess identical information on major environmental threats due to the company's actions, the government has a higher bar of (moral and legal) accountability.

Additional proof of the porous border separating the oil industry's ambitions and national decision-making processes lies in the political activities of many oil actors from the beginning of the oil industry (Auzanneau, 2018). For example, Jean-Baptiste Trystram, one of the first owners of an oil refinery in France (1860s), became a senator and supported industrial actors and activities (Denise, 1988). Nelson

⁸ It should be noted that, while we focus on the link between states and corporations, and the accountability it implies, we do not think that the lack of that link in the case of private oil corporations implies lack of accountability. Furthermore, private corporations often have had close ties to public entities, e. g., access to funds and subsidies, and influence via campaign donations and lobbying, see, e.g., Coll (2012), Erickson et al. (2017), McBeath (2016).

Rockefeller, the grandson of John D. Rockefeller, the founder of Standard Oil, served, among others, as the director of Creole Petroleum, a Standard Oil affiliate, before becoming an American politician and reaching the positions of governor and Vice-President (1970s) (Britannica, 2023).

Discourses of oil corporations' actors also illustrate their influence and power. For instance, Patrick Pouyanné, chairman and CEO of TotalEnergies, explained in 2014 that "even though Total is a private company, it is the largest French company, and in a way, it represents the country itself" (Agence France-Presse, 2014). This echoes the point made by Barkan on 'corporate sovereignty' where corporate power and public governance systems should not be seen as two distinctive topics (Barkan, 2013). Such power eventually transpires in inefficient policies, delays in actions, enshrined industrial protection, and distant or vague commitments of national governments on environmental protection and climate actions (Bonneuil et al., 2021; Deneault, 2018; Roche, 2020).

5.1. A translation of oil corporations' omission in policies and public declarations

Although discussing pollution, the Stockholm Declaration of 1972 only hints at global warming and climate change without mentioning them (The United Nations, 1972, p.20). In 1987, another important public and international report was published by the World Commission on Environment and Development, called the Brundtland report. Fifteen years after the emergence of the international environmentalism movement, the tone used in the Brundtland report was radically different. There was no doubt anymore about the link between carbon dioxide emissions from fossil fuels and global warming (Brundtland, 1987, p.12). The document mentioned the greenhouse effect and its origins and linked environmental issues to economic development. Yet, the influence of governments to protect the oil industry kept appearing in a founding European treaty of the same year, in 1987, with the Single European Act. This treaty marks the first implementation in European treaties of the necessity to protect the environment. However, at the end of the document, a crucial limitation is declared:

The conference confirms that the Community's activities in the sphere of the environment may not interfere with national policies regarding the exploitation of energy resources (Single European Act, 1987, p.25).

On the first founding treaty of the European Union incorporating the environmental topic and, on the article prescribing a rational, thus sustainable, use of resources, national governments obviously protected again the oil industry. The geopolitical context of the Cold War could have played a role in the decision to constantly secure access to oil, and the notions of 'national security' and 'energy security' reappear as justification for these actions, or inactions here (Obeng-Odoom, 2010; Tarvainen, 2022). Nevertheless, with the early knowledge they had of the detrimental impacts of the oil industry on the climate and the environment, governments enshrined this industrial protection in a founding treaty of the European Union initially meant to celebrate the protection of the environment on the continent. This disregard for the environmental impacts of the energy industry could be considered a wanton act, if not an unlawful one considering the objectives described in the first article of this chapter on "environment": "to preserve, protect and improve the quality of the environment; to contribute towards protecting human health; to ensure a prudent and rational utilization of natural resources".

5.2. Governments and National governments are (at least) as guilty as oil corporations

As Peel and Osofsky already highlighted in 2020, climate litigation is experiencing substantial growth because the "Growing interest in courts as an avenue for pushing for positive action on climate change is also a

consequence of frustration with the inadequacy of government action” (Peel and Osofsky, 2020). The knowledge of national governments through oil corporations is difficult to identify. However, besides the early warning from Arrhenius and Callendar, national governments and oil corporations acting as one tend to support the argument that both knew – or should have known - about the detrimental effects of the oil industry on the environment and the climate but did not take decisive actions. These arguments relate to two of the main reasons used to file cases against both governments and corporations so far (past knowledge and lack of action) and are increasingly pushed forward by citizens and associations and supported by judges (The Economist, 2022). Yet, such judges are unable to decide on the basis of ecocide because of its lack of integration in treaties and laws in an internationally recognized way as an environmental crime (Nellemann et al., 2016) committed with knowledge to sue governments and oil corporations, not individually, but simultaneously.

National governments had the duty to inform and to act before it became irreversible, but chose not to, inaction that makes such governments culpable for an ecocide charge. This vision of national governments’ responsibilities is in line with the ethical, political, and legal duties one can expect from a national public entity. National governments are giving exploitation rights and of course favoring their own national corporations in the attribution of oil fields, even defending them in cases of obvious pollution and doing so while not necessarily having shares in these corporations (Frynas, 2003). Currently, some of the biggest oil corporations, including Gazprom, China National Petroleum Corporation and Equinor, are wholly or partly state-owned. Thus, the responsibility of national governments in addressing pollution and greenhouse gas emissions of this major polluting industry is greater than ever. The public ownership of corporations exploiting natural resources could prove effective, but according to critics it is inefficient in tackling the ‘tragedy of the commons’ described by Hardin (Hardin, 1968), the unequal share of wealth and pollution (Anand, 2004, pp. 56–57), and enforcing more sustainable practices upon powerful and destructive industries (Järvensivu et al., 2019). So, states have become comatose in the face of growing climate crises (see also Wiman, 2019).

The delay between oil corporations’ discoveries on the effects of their industry on the climate and actual regulations aimed at tackling greenhouse gas emissions by governments illustrates governments’ protection of the sector. To demonstrate this delay, a comparison with the enforcement of a national carbon tax is apt, although this tax also comes with exemptions in different countries to protect industrial-intensive regions and large energy consumers (Ghazouani et al., 2020). Table 2 collects some information on national governments, the corporations in which they were stakeholders, and the years in which the corporations probably knew of the destructive effects of their activities.

6. Discussion

It is now quite clear that many major oil corporations knew since the 1950s and 1960s about the detrimental effects of their products on the climate (Bonneuil et al., 2021; Supran et al., 2023). The fact that these corporations were, even if partially, State-owned companies, in addition to available scientific evidence on the issue, form a body of evidence demonstrating national governments’ long disregard for the incoming global environmental disaster. This ecocidal act of national governments in their collaboration and protection of the oil industry is, however, not sufficiently addressed in the literature. The business-as-usual which still prevails in oil corporations’ strategies, where more exploration and exploitation of resources are planned, follows and is protected by the path created by the support of governments after the First World War (Black, 2018), and enhanced after the end of the Second World War (Auzanneau, 2018; Mitchell, 2013, p. 30; Yergin, 2011, pp. 391–412). This path, through the knowledge these actors had, was taken on purpose in the 1970s through the acknowledgment of the environmental

changes to come, and the need for the economy and the industry to adapt to them. American leaders of the different sectors met on this topic in a workshop called “Living with Climatic Change” organized by the Mitre Corporation in Virginia in 1976 (Keitz and Berks, 1976). Although recognizing the changes to come and their challenges, they rejected the enforcement of regulations on polluting but important corporations for the American economy as a solution, while emphasizing the lack of precise understanding as a justification (Keitz and Berks, 1976).

The fact that many national governments had shares in major oil corporations until at least 1990 needs to be considered with the contemporary rise of the environmental movement internationally in the 1970s, and even more in the European Union since the Single European Act of 1987. This seeming contradiction was broadly the focus of George Stigler’s ‘the economic theory of regulation’ in which Stigler claimed that regulations by governments are not for the public interest but for the benefit of industrial interests (Stigler, 1971). What sort of credibility can exist when decision-makers taking national and international commitments to protect the climate and the environment are, at the same time, shareholders and protectors of corporations responsible for disastrous pollution? On the one hand, governments pleaded for more environmental protection in treaties and declarations. On the other hand, they protect, among others, oil corporations from constraining environmental treaties and commitments by limiting the applicability of environmental principles (De Sadeleer, 2020, p. 526; Majone, 2002; Pallemaerts, 1993; Pedersen, 2010), or by removing their country from said treaties (like the United States with the Kyoto Protocol of 1997, or the Paris Agreement of 2015). National governments end up as lobbyists in international summits to protect the activities of their (national) oil corporations, with today’s consequences: strong investments in fossil-fuels activities; increased natural disasters caused by climate change; weak political commitments and policies to enact and enforce necessary constraints on polluting activities; and an absence of liability for actors that hid the truth when they could have prevented irreversible damages.

7. Conclusion

Aware of their power to shape the various economic, scientific, societal, and environmental layers (Hein, 2016, 2018), oil corporations remain relatively untouched by constraining environmental rules and objectives. Recent high profits of major oil corporations linked to the current war in Ukraine have not only proven difficult to tax to support the society and the transition effort, but have also led them to further invest in explorations while reducing their environmental objectives (Bouso et al., 2023; Jolly and Elgot, 2022). National governments’ support for oil corporations remains strong and the close relationship between national governments and oil corporations is slowing down the implementation of more sustainable practices (Ekblom, 2019).

Can the early relationship between oil corporations and national governments and lack of climate actions by both actors count as ecocide? If so, should remedial strategies appeal to freer markets for oil or greater state regulation? Answering these questions help to identify the origin of delays in taking actions toward sustainability, as well as the reasons behind them. These are important steps to trigger, support, and sustain a necessary political transformation. Since the rise of the environmentalism movement internationally in the 1970s, the number of environmental regulations exploded (Maljean-Dubois and Rajamani, 2011; Weiss, 1992). Yet, the regulations have failed to meet the environmental challenge, while the possibility to avoid irremediable global warming is fading away. Governments have not implemented efficient regulations aimed at reducing carbon emissions, including taxation, and if implemented they came considerably later than the time they knew-or should have known-the potential impacts of the fossil fuel-induced climate change. This is the result of long-standing decision-making practices influenced by industrial actors and prioritizing economic growth over sustainable development (Pallemaerts, 1993; Sunikka,

2001). This behavior, of both oil corporations and national governments, satisfies the requirements recently defined for the crime of ecocide, which can now be prosecuted for economic, social, and environmental justice. The United Nations General Assembly found it necessary to “request for an advisory opinion of the International Court of Justice on the obligations of National governments in respect of climate change”. This is to launch an investigation into national governments’ harm to climate systems, referring to ecocide, without citing the definition (General Assembly of the United Nations, 2023). The evidence suggests that European courts are increasingly looking favorably at such cases. Indeed, of the 6000 cases filed since the Paris Agreement in 2015, nearly 60 per cent have received favorable decisions that seek to repair the climate (The Economist, 2021; Setzer and Higham, 2021, 2023).

Therefore, a more radical transformation of political and legal systems is advocated with a “self-cleansing mechanism” where outdated and oil-influenced theories, policies, and rules can be pushed out by up-to-date knowledge and sustainable priorities (Lowe, 1999). Nationalization offers no guarantee against ecocide because, as recent research (Grasso et al., 2023) shows, state-owned oil corporations do not necessarily have strong environmental quality records. This mechanism can be further supported not so much by so-called nationalization, even partial, of these transnational corporations, believed to have the capability to better control polluting industrial sectors and their constant quest for maximized profits (Thurber and Istad, 2010; Wolf and Pollitt, 2009), but rather by embedding the ownership and control of oil in community structures. This attempt to common the land contributes to enhancing the power of community and commons, by reinvigorating and embedding (oil) power within community structures (Polanyi, 1944/2001) and taking evolutionary steps toward ‘just ecological political economy’ (Obeng-Odoom, 2021).

This is particularly important because most oil corporations acknowledged the climate change issue and the need to act, with a few of them now leaving lobbying groups denying global warming and fixing emission reduction targets (Bouso, 2021; Kottasová, 2019). However, these public declarations hide a consistent influence on decision-making processes to prevent or delay regulations or policies promoting necessary actions to transform energy systems and financial flows (Bouwen, 2002; Corporate Europe Observatory, 2017; Laville, 2019b). Thus, the main issue does not seem to lie in the ownership topic, either public or private, but rather in the knowledge of all actors. Has shown in this article, governments knew or should have known, and did little or nothing to solve the issue. Better commitments towards transparency, active prosecutions based on the implementation of ecocide-based prosecutions, and empowered enforcement agencies can help tackle such detrimental lobbying practices (Lukat et al., 2023).

The lack of accountability, not only by oil corporations that knew and kept their business-as-usual practices but also by governments that supported them and contributed to hiding the truth, is an obstacle to the systemic change required to meet contemporary energy and environmental objectives. Facilitating the possibility of local communities affected by oil activities to bring their cases to their national authorities, but also to oil corporations’ home countries, is another important phase towards a positive change and the recognition of ecocide across the globe.

CRedit authorship contribution statement

Stephan J. Hauser: Conceptualization, Formal analysis, Investigation, Methodology, Resources, Validation, Writing – original draft, Writing – review & editing. **Tere Vadén:** Conceptualization, Methodology, Validation, Writing – review & editing. **Michiru Nagatsu:** Conceptualization, Investigation, Methodology, Validation, Writing – review & editing. **Franklin Obeng-Odoom:** Conceptualization, Investigation, Methodology, Validation, Writing – review & editing. **Jussi T. Eronen:** Conceptualization, Investigation, Methodology, Validation,

Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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References

- Abrell, J., Kosch, M., Rausch, S., 2019. How effective was the uk carbon tax?—a machine learning approach to policy evaluation. *A Mach. Learn. Approach Policy Eval.*
- Agence France-Presse. (2014, November 28). Poutine rencontre pour la première fois le nouveau PDG de Total. *L'Express*. (https://lexpansion.lexpress.fr/actualites/1/actualite-economique/poutine-rencontre-pour-la-premiere-fois-le-nouveau-pdg-de-total_1627195.html) (https://lexpansion.lexpress.fr/actualites/1/actualite-economique/poutine-rencontre-pour-la-premiere-fois-le-nouveau-pdg-de-total_1627195.html). Accessed on April 3rd, 2023.
- Altvater, E., 2006. The social formation of capitalism, fossil energy, and oil-imperialism. *Colloquium on the Economy. Society and Nature*, Centre for Civil Society, University of KwaZulu Natal.
- Anand, R., 2004. *International Environmental Justice: A North-South dimension*. Routledge.
- Anderson, T.R., Hawkins, E., Jones, P.D., 2016. CO₂, the greenhouse effect and global warming: from the pioneering work of Arrhenius and Callendar to today's Earth System Models. *Endeavour* 40 (3), 178–187.
- Arkush, D., Braman, D., 2023. Climate homicide: prosecuting big oil for climate deaths. *Harv. Environ. Law Rev.* 48 (1).
- Arrhenius, S., 1896. XXXI. On the influence of carbonic acid in the air upon the temperature of the ground. *Lond. Edinb. Dublin Philos. Mag. J. Sci.* 41 (251), 237–276.
- Auzanneau, M. (2018). *Oil, Power, and War*. Chelsea Green.
- Barkan, J., 2013. *Corporate Sovereignty: Law and Government under Capitalism*. U of Minnesota Press.
- Berle, A.A., Means, G.C., 1932/2017. *The Modern Corporation and Private Property*. Routledge, London.
- Black, B.C., 2018. How World War I ushered in the century of oil. *Observer*.
- Bonneuil, C., Choquet, P.L., Franta, B., 2021. Early warnings and emerging accountability: Total's responses to global warming, 1971–2021. *Glob. Environ. Change* 71. <https://doi.org/10.1016/j.gloenvcha.2021.102386>.
- Bouso, R., 2021. France's Total Quits Top U.S. Oil Lobby in Climate Split. January 15. *Reuters*. (<https://www.reuters.com/article/us-total-api-idUSKBN29K1LM>). January 15.
- Bouso, R., Jessop, S., Nasralla, S., 2023. Climate-focused Investors Irked by BP's Pivot Back to Oil. *Reuters*. (<https://www.reuters.com/business/sustainable-business/change-bp-climate-goal-concern-emissions-focused-investors-shareholder-2023-02-10/>). Accessed on April 3rd, 2023.
- Bouwen, P., 2002. Corporate lobbying in the European Union: the logic of access. *J. Eur. Public Policy* 9 (3), 365–390.
- Bowen, G.A., 2009. Document analysis as a qualitative research method. *Qual. Res. J.* 9 (2), 27–40.
- Bannon Jr, H.R., Daughtry, A.C., Perry, D., Whitaker, W.W., Williams, M., 1957. Radiocarbon evidence on the dilution of atmospheric and oceanic carbon by carbon from fossil fuels. *Eos, Trans. Am. Geophys. Union* 38 (5), 643–650.
- Brisman, A., South, N., 2014. *Green Cultural Criminology: Constructions of Environmental Harm, Consumerism, and Resistance to Ecocide*. Routledge.
- Britannica, T. Editors of Encyclopaedia (2023, May 23). *Nelson Rockefeller*. *Encyclopedia Britannica*. (<https://www.britannica.com/biography/Nelson-Rockefeller>). Accessed on June 28th, 2023.
- Callendar, G.S., 1938. The artificial production of carbon dioxide and its influence on temperature. *Q. J. R. Meteorol. Soc.* 64 (275), 223–240.
- Center for International Environmental Law. (2016). *New Documents Reveal Oil Industry Knew of Climate Risks Decades Earlier Than Suspected; Suggest Coordinated Efforts to Foster Skepticism*. (<https://www.ciel.org/news/smoke-and-fumes/>). Accessed on April 3rd, 2023.
- Center for International Environmental Law. (n.d.). *Smoke & Fumes*. (<https://www.smokeandfumes.org/>). Accessed on April 3rd, 2023.
- Chamberlin, T.C., 1899. An attempt to frame a working hypothesis of the cause of glacial periods on an atmospheric basis. *J. Geol.* 7 (6), 545–584.
- Climate Investigations Center. (2014a). *Climate Investigations Center*. (<https://climateinvestigations.org/>). Accessed on April 7th, 2023.

- Climate Investigations Center. (2014b). ClimateFiles. (<https://www.climatefiles.com/>). Accessed on April 7th, 2023.
- Cohen, M., Lanovoy, V., Martini, C., Rocha, A., Tigre, M.A., Xavier, E., 2024. Reparation for Climate Change at the ECtHR: A Missed Opportunity or the First of Many Decisions to Come?, 2024/5/10 VerfBlog. <https://doi.org/10.59704/3fe5fe45d83b4da7>. (<https://verfassungsblog.de/reparation-for-climate-change-at-the-ecthr/>), 2024/5/10.
- Coll, S., 2012. *Private Empire: ExxonMobil and American Power*. Penguin.
- Corporate Europe Observatory. (2017). *The Corporate Europe Observatory guide to the murky world of EU lobbying*.
- De Sadeleer, N., 2020. *Environmental principles: from political slogans to legal rules*. Oxford University Press.
- Deneault, A., 2018. Total, un gouvernement bis. *Le Monde Dipl.* 8, 21. (<https://www.monde-diplomatique.fr/2018/08/DENEAULT/58987>). Accessed on April 3rd, 2023.
- Denise, J., 1988. *La Belle Époque à Dunkerque* 3.
- Distefano, T., D'Alessandro, S., 2023. Introduction of the carbon tax in Italy: Is there room for a quadruple-dividend effect? *Energy Econ.* 120, 106578.
- Eklblom, J., 2019. European Investment Bank postpones decision on fossil fuel lending. Reuters. (<https://www.reuters.com/article/us-europe-eib-fossilfuels/european-investment-bank-postpones-decision-on-fossil-fuel-lending-idUSKBN1WU1P1>).
- Eklund, R.L., Knapp, L.C., Sandifer, P.A., Colwell, R.C., 2019. Oil spills and human health: Contributions of the Gulf of Mexico Research Initiative. *GeoHealth* 3 (12), 391–406.
- ENI. (2023). ENI Shareholders. Eni.Com. (<https://www.eni.com/en-IT/about-us/governance/shareholders.html>). Accessed on October 17, 2023.
- ENI. (2024). Timeline. Eni.com. (<https://www.eni.com/static/longform-enistoria/>) Accessed on July 17, 2024.
- Erickson, P., Down, A., Lazarus, M., et al., 2017. Effect of subsidies to fossil fuel companies on United States crude oil production. *Nat. Energy* 2, 891–898. <https://doi.org/10.1038/s41560-017-0009-8>.
- Exxon Research and Engineering Company. (1982). Memo to Exxon Management about CO2 "Greenhouse" Effect. (<https://www.climatefiles.com/exxonmobil/1982-memo-to-exxon-management-about-co2-greenhouse-effect/>). Accessed on April 7th, 2023.
- Franta, B., 2021. Early oil industry disinformation on global warming. *Environ. Polit.* 30 (4), 663–668.
- Frumhoff, P.C., Heede, R., Oreskes, N., 2015. The climate responsibilities of industrial carbon producers. *Clim. Change* 132, 157–171. <https://doi.org/10.1007/s10584-015-1472-5>.
- Frynas, J.G., 2003. Royal dutch/shell. *N. Political Econ.* 8 (2), 275–285.
- Galbraith, J.K., 1967. *The New Industrial State*. Hamish Hamilton, London.
- Garud, R., Karnøe, P., 2001. Path creation as a process of mindful deviation. *Path Depend. Creat.* 138.
- General Assembly of the United Nations. (2023). Request for an advisory opinion of the International Court of Justice on the obligations of National governments in respect of climate change: resolution / adopted by the General Assembly. The United Nations.
- Ghazouani, A., Xia, W., ben Jebli, M., Shahzad, U., 2020. Exploring the role of carbon taxation policies on CO2 emissions: contextual evidence from tax implementation and non-implementation European Countries. *Sustainability* 12 (20), 8680.
- Grasso, M., Heede, R., 2023. Time to pay the piper: Fossil fuel companies' reparations for climate damages. *One Earth* 6 (5), 459–463. <https://doi.org/10.1016/j.onear.2023.04.012>.
- Gutès, M.C., 1996. The concept of weak sustainability. *Ecol. Econ.* 17 (3), 147–156.
- Hansen, J., Lebedeff, S., 1987. Global trends of measured surface air temperature. *J. Geophys. Res.: Atmos.* 92 (D11), 13345–13372.
- Hansen, J., Fung, I., Lacis, A., Rind, D., Lebedeff, S., Ruedy, R., Russell, G., Stone, P., 1988. Global climate changes as forecast by Goddard Institute for Space Studies three-dimensional model. *J. Geophys. Res.: Atmos.* 93 (D8), 9341–9364.
- Hardin, G., 1968. The tragedy of the commons: the population problem has no technical solution; it requires a fundamental extension in morality. *Science* 162 (3859), 1243–1248.
- Hauser, S., 2022. The Oil is Dying? Long Live its' Heritage"! The Refining of Legal Systems and Port-Cities' Planning. In *A+ BE| Archit. Built Environ.* (Issue 02). A+ BE= Archit. Built Environ.
- Hauser, S.J., Aktürk, G., 2022. Investigate past polluting activities on public health and land uses. *Cities* 123, 103599.
- Hein, C., 2016. Analyzing the palimpsestic petroleumscape of Rotterdam. *Glob. Urban Hist.*
- Hein, C., 2018. "Old Refineries Rarely Die": Port City Refineries as Key Nodes in The Global Petroleumscape. *Can. J. Hist.* 53 (3), 450–479.
- Higgins, P., Short, D., South, N., 2013. Protecting the planet: a proposal for a law of ecocide. *Crime. Law Soc. Change* 59 (3), 251–266. <https://doi.org/10.1007/s10611-013-9413-6>.
- Hmiel, B., Petrenko, V. v., Dyonisius, M.N., Buizert, C., Smith, A.M., Place, P.F., Harth, C., Beaudette, R., Hua, Q., Yang, B., 2020. Preindustrial 14 CH 4 indicates greater anthropogenic fossil CH 4 emissions. *Nature* 578 (7795), 409–412.
- Hormio, S., 2024. *Taking Responsibility for Climate Change*. Palgrave MacMillan, London.
- Independent Expert Panel for the Legal Definition of Ecocide. (2021). Ecocide. Stop Ecocide Foundation. (<https://www.stopecocide.earth/legal-definition>). Accessed on June 28th, 2023.
- Jacobs, R.P.W.M., Griffiths, M.H., Bright, P.E., Homer, J.B., van Oudenhoven, J.A.C.M., & Waller, J. (1988). *The Greenhouse Effect*. (<https://www.climatefiles.com/shell/1988-shell-report-greenhouse/>). (Accessed on 7 April 7 2023).
- Jacques, P.J., Dunlap, R.E., Freeman, M., 2008. The organisation of denial: Conservative think tanks and environmental scepticism. *Environ. Polit.* 17 (3), 349–385.
- Järvensivu, P., Toivanen, T., Vaden, T., Lähde, V., Majava, A., & Eronen, J.T. (2019). Governance of economic transition. *Global Sustainable Development Report*.
- Johnston, J.E., Lim, E., Roh, H., 2019. Impact of upstream oil extraction and environmental public health: a review of the evidence. *Sci. Total Environ.* 657, 187–199.
- Jolly, J., Elgot, J., 2022. Profits at world's seven biggest oil firms soar to almost £150bn this year. *Guardian*. (<https://www.theguardian.com/business/2022/oct/27/profits-at-worlds-seven-biggest-oil-firms-soar-to-almost-150bn-this-year-windfall-tax>).
- Kahn, B., 2023. New climate paper calls for charging big US oil firms with homicide. *Guardian*. Accessed on April 3rd, 2023.
- Keitz, E., Berks, D., 1976. *Living with Climatic Change: Phase II*. The MITRE Corporation.
- Kogan, T.B., Salganik-Shoshan, G., 2015. Corporate governments: Government connections of public oil and gas companies. *Corp. Ownersh. Control* 12 (4), 286–302.
- Kottasová, I., 2019. Shell quits major US oil lobby over climate change. *CNN Bus.* (<https://edition.cnn.com/2019/04/02/business/shell-climate-change-afpm/index.html>) April 2.
- Laville, S., 2019a. Top oil firms spending millions lobbying to block climate change policies says report. *Guardian*. (<https://www.theguardian.com/business/2019/mar/22/top-oil-firms-spending-millions-lobbying-to-block-climate-change-policies-says-report>).
- Laville, S. (2019b, October 24). Fossil fuel big five "spent €251m lobbying EU" since 2010. (<https://www.theguardian.com/business/2019/oct/24/fossil-fuel-big-five-spent-251m-lobbying-european-union-2010-climate-crisis>). Accessed on April 3rd, 2023.
- Le Roux, T., 2016. Chemistry and industrial and environmental governance in France, 1770–1830. *Hist. Sci.* 54 (2), 195–222.
- Leijten, I., 2019. Human rights v. Insufficient climate action: the Urgenda case. *Neth. Q. Hum. Rights* 37 (2), 112–118. <https://doi.org/10.1177/0924051919844375>.
- Levantesi, S., Franta, B., 2023. Italian oil giant eni knew about climate change more than 50 years ago, report reveals. *Desmog*. (<https://www.desmog.com/2023/09/24/it-alian-oil-giant-eni-knew-about-climate-change-more-than-50-years-ago-report-reveals/>).
- Lipsky, D., 2023. *The Parrot and the Igloo. Climate and the Science of Denial*. W.W. Norton.
- Los Angeles Times. (1987, August 21). Thatcher Government to Sell 31.5% BP Stake in Biggest-Ever Stock Offer. *Los Angeles Times*. (<https://www.latimes.com/archives/la-xpm-1987-08-21-fi-2366-story.html>). Accessed on April 3rd, 2023.
- Lowe, V., 1999. Sustainable Development and Unsustainable Arguments. *International law and sustainable development: past achievements and future challenges*. Oxford University Press, Oxford, pp. 36–37.
- Lukat, E., Lenschow, A., Dombrowsky, I., Meergans, F., Schütze, N., Stein, U., Pahl-Wostl, C., 2023. Governance towards coordination for water resources management: The effect of governance modes. *Environ. Sci. Policy* 141, 50–60.
- Lynch, M.J., Fegadel, A., Long, M.A., 2021. Green criminology and state-corporate crime: the ecocide-genocide nexus with examples from Nigeria. *J. Genocide Res.* 23 (2), 236–256. <https://doi.org/10.1080/14623528.2020.1771998>.
- Majone, G., 2002. The precautionary principle and its policy implications. *JCMS: J. Common Mark. Stud.* 40 (1), 89–109.
- Maljean-Dubois, S., Rajamani, L., 2011. *La mise en oeuvre du droit international de l'environnement*. Martinus Nijhoff.
- McBeath, J., 2016. *Big Oil in the United States: Industry Influence on Institutions, Policy, and Politics*. Praeger.
- McGreal, C., 2021. Big oil and gas kept a dirty secret for decades. Now they may pay the price. *Guardian*.
- Meadows, D.H., Meadows, D.L., Randers, J., Behrens, W.W., 1972. *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. New American Library.
- Mehta, S., Merz, P., 2015. Ecocide – a new crime against peace? *Environ. Law Rev.* 17 (1), 3–7. <https://doi.org/10.1177/1461452914564730>.
- Milman, O., 2023. Revealed: Exxon made "breath-takingly" accurate climate predictions in 1970s and 80s. *Guardian*. (<https://www.theguardian.com/business/2023/jan/12/exxon-climate-change-global-warming-research>). Accessed on April 3rd, 2023.
- Minkova, L.G., 2023. The fifth international crime: reflections on the definition of "Ecocide". *J. Genocide Res.* 25 (1), 62–83.
- Mitchell, T., 2013. *Carbon Democracy*. Verso Books.
- National Petroleum Council. (1972). *Environmental Conservation - The Oil and Gas Industries Volume Two*.
- Nellemann, C., Henriksen, R., Kreilhuber, A., Stewart, D., Kotsoyova, M., Raxter, P., Mrema, E., Barrat, S., 2016. The rise of environmental crime: a growing threat to natural resources, peace, development and security. *U. Nations Environ. Program. (UNEP)*.
- Nissen, A., 2021. A greener shade of black? Statoil, the Norwegian government and climate change, 1990–2005. *Scand. J. Hist.* 46 (3), 408–429.
- Nolt, J., 2011. How harmful are the average American's Greenhouse Gas Emissions? *Ethics, Policy Environ.* 14 (1), 3–10. <https://doi.org/10.1080/21550085.2011.561584>.
- Norwegian Ministry of the Environment. (2005). *Norway's Report on Demonstrable Progress under the Kyoto Protocol*. (<https://unfccc.int/resource/docs/dpr/nor1.pdf>). Accessed on April 10th, 2023.
- Obeng-Odoom, F., 2010. Avoiding the oil curse in Ghana: is transparency sufficient? *Afr. J. Int. Aff.* 13 (1–3), 89–120.
- Obeng-Odoom, F., 2014. *Oiling the Urban Economy: land, labour, capital, and the state in Sekondi-Takoradi, Ghana*. Routledge.

- Obeng-Odoom, F., 2018. Transnational corporations and urban development. *Am. J. Econ. Sociol.* 77 (2), 447–510.
- Obeng-Odoom, F., 2021. *The Commons in an Age of Uncertainty: Decolonizing Nature, Economy, and Society*. University of Toronto Press, Toronto.
- Obeng-Odoom, F., 2022. 'Editor's Introduction: Rethorizing Ecological Imperialism'. *Am. J. Econ. Sociol.* vol. 81 (3), 417–441.
- Office of the Attorney General for the District of Columbia. (2020, June 25). AG Racine Sues Exxon Mobil, BP, Chevron, and Shell for Misleading Consumers About the Role Fossil Fuels Play in Climate Change. Office of the Attorney General for the District of Columbia. (<https://oag.dc.gov/release/ag-racine-sues-exxon-mobil-bp-chevron-and-shell>). Accessed on April 6th, 2023.
- Pallemaerts, M., 1993. Greening international law. In: Sands, P. (Ed.), *International Environmental Law from Stockholm to Rio: Back to the Future?* In *in*, 1993. Earthscan Publications, London, pp. 1–19.
- Palmer, I., 2023. A Fresh Reading Of Exxon's Predictions Of Global Warming And Climate Change From 40 Years Ago. *Forbes*. (<https://www.forbes.com/sites/ianpalmer/2023/01/17/a-fresh-reading-of-exxons-predictions-of-global-warming-and-climate-change-from-40-years-ago/?sh=41e2765b7840>). Accessed on April 3rd, 2023.
- Pearce, D.W., Atkinson, G.D., 1993. Capital theory and the measurement of sustainable development: an indicator of "weak" sustainability. *Ecol. Econ.* 8 (2), 103–108.
- Pedersen, O.W., 2010. Environmental principles and environmental justice. *Environ. Law Rev.* 12 (1), 26–49.
- Peel, J., Osofsky, H.M., 2020. Climate change litigation. *Annu. Rev. Law Soc. Sci.* 16, 21–38.
- Polanyi, K., 2001. *The Great Transformation: The Political and Economic Origins of Our Time*. Beacon Press, Massachusetts.
- Polo, J.-F., Fressoz, F., 1992. L'Etat réduit de 34 à 15% la participation publique dans Total. *Les Echos*.
- Rannard, G., 2023. ExxonMobil: Oil Giant Predicted Climate Change in 1970s - Scientists. *BBC*. (<https://www.bbc.com/news/science-environment-64241994>). Accessed on April 3rd, 2023.
- Robinson, E., Robbins, R.C., 1968. Sources, abundance, and fate of gaseous atmospheric pollutants. Final report and supplement. Stanford Research Institute, Menlo Park, CA.
- Rocamora, A., 2017. *The Rise of Carbon Taxation in France: From Environmental Protection to Low-Carbon Transition*. Institute for Global Environmental Strategies, Hayama, Japan.
- Roche, C., 2020. Sur les énergies renouvelables, un discours peu renouvelé. *Discours Adm. Droit(S.) Et. Transform. Soc.*
- Rodhe, H., Charlson, R., Crawford, E., 1997. Svante Arrhenius and the greenhouse effect. *Ambio* 2–5.
- Setzer, J., Higham, C., 2021. Climate change litigation is growing and targeting companies in different sectors. *Bus. Rev.* (<https://blogs.lse.ac.uk/businessrev>iew/2021/10/04/climate-change-litigation-is-growing-and-targeting-companies-in-different-sectors/).
- Setzer J. and Higham C. (2023) *Global Trends in Climate Change Litigation: 2023 Snapshot*. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science;
- Single European Act*, (1987) (testimony of The European Communities). (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:11986U/TXT&from=EN>). Accessed on April 10th, 2023.
- Stigler, J.G., 1971. The theory of economic regulation. *Bell J. Econ. Manag. Sci.* 2 (1), 3–21.
- Suess, H.E., 1955. Radiocarbon concentration in modern wood. *Science* 122 (3166), 415–417.
- Sunikka, M. (2001). 'Policies and regulations for sustainable building. A comparative study of five European countries.
- Supran, G., Rahmstorf, S., Oreskes, N., 2023. Assessing ExxonMobil's global warming projections. *Sciences* 6628, 379.
- Sydow, J., Windeler, A., Müller-Seitz, G., Lange, K., 2012. Path constitution analysis: A methodology for understanding path dependence and path creation. *Bus. Res.* 5, 155–176.
- Tarvainen, L., 2022. False Promises of Development? Oil Extractivism in Uganda. University of Helsinki. (<https://helda.helsinki.fi/items/aa20bfc4-6d4c-4c07-8816-4e0be1477819>).
- The Economist, 2021, 'Climate Lawsuits: Habeas Carbon' in The FED that Failed: How Inflation humbled America's Central Bank, pp. 55-57.
- The Economist. (2022, April 23). Climate Lawsuits: Habeas Carbon. The Economist.
- The United Nations. (1972). Report of the United Nations Conference on the Human Environment.
- The World Commission on Environment and Development. (1987). Our common future.
- Thurber, M.C., Istad, B.T., 2010. Norway's evolving champion: statoil and the politics of state enterprise. *Program Energy Sustain. Dev. Work. Pap.* 92.
- Watts, J., 2020. Oil and gas firms "have had far worse climate impact than thought.". *Guardian*. (<https://www.theguardian.com/environment/2020/feb/19/oil-gas-industry-far-worse-climate-impact-than-thought-fossil-fuels-methane>).
- Weiss, E.B., 1992. International environmental law: contemporary issues and the emergence of a new world order. *Geo. LJ* 81, 675.
- Whyte, D., 2020. *Ecocide: Kill the Corporation Before it Kills Us*. Manchester University Press, Manchester, UK.
- Wiman, H., 2019. An approach to post-growth pensions with reflections on Finland, Sweden and Denmark. *Conf. Pap.: Towards Resilient Nord. Welf. S.*
- Wolf, C.O.H., Pollitt, M.G., 2009. The welfare implications of oil privatization: a cost-benefit analysis of Norway's statoil. *Camb. Work. Pap. Econ.*
- Yergin, D., 2011. *The Prize: The Epic Quest For Oil, Money & Power*. Simon and Schuster.