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Transnational Corporations, Biosphere Stewardship, and Sustainable Futures

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Abstract

Corporations are perceived as increasingly powerful and critically important to ensuring that irreversible climatological or ecological tipping points on Earth are not crossed. Environmental impacts of corporate activities include pollution of soils, freshwater and the ocean, depletion of ecosystems and species, unsustainable use of resources, changes to air quality, and alteration of the global climate. Negative social impacts include unacceptable working conditions, erosion of traditional practices, and increased inequalities. Multiple formal and informal mechanisms have been developed, and innovative examples of corporate biosphere stewardship have resulted in progress. However, the biosphere crisis underscores that such efforts have been insufficient and that transformative change is urgently needed. We provide suggestions for aligning corporate activities with the biosphere and argue that such corporate biosphere stewardship requires more ambitious approaches taken by corporations, combined with new and formalized public governance approaches by governments.

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1. INTRODUCTION

The interconnected world economy is embedded in the biosphere and is dependent on a healthy, living planet (1, 2). However, anthropogenic change influences the biosphere in diverse ways (3), and one way of attributing responsibility for change and environmental stewardship is to focus on corporate actors (4–10). Such actors may be operating internationally or globally—and generate various social and environmental impacts (7). Governments, however, primarily design governance mechanisms at the national level, and existing international regulations have important limitations (11–15). Such approaches are consequently inadequate for managing the global impacts of corporations. We investigate why this dilemma arises and how it has been addressed, and discuss how advances can be made.

We consider the role of corporations in the context of sustainable development and explore what norms are influential in their operations as a precursor to identifying possibilities for them to engage in stewardship of the biosphere for sustainable futures. Biosphere stewardship is an adaptive, learning- and knowledge-based, collaborative process of responsibility and ethics aimed at shepherding and safeguarding the resilience of the biosphere for human well-being and future generations and fostering the sustainability of a rapidly changing planet (6, 7, 16–19). We review the scientific literature on environmental governance associated with corporations and illustrate how negative impacts on the biosphere result from corporate activity. We describe how different actors, including states, the private sector, and civil society, influence corporations to integrate environmental and social concerns into corporate strategies and actions. These activities are considered within the context of the scientific understanding of how natural systems and biodiversity are being degraded (20, 21), underscoring that existing approaches have not been sufficient for the scale and complexity of the problems being faced. The world is simply not on track to achieve internationally agreed upon targets (22), including the United Nations Sustainable Development Goals (SDGs).

The biosphere crisis can be described as the risk of crossing climatological and ecological tipping points (7, 23–25), and growing awareness of this crisis has increasingly led companies to engage with sustainability. Consequently, they have adapted their communication and/or strategies to ensure that they are able to maintain their social license to operate (26, 27). What used to be perceived as a simple trade-off between core business values (profits) and common goods (environmental and social good) is now increasingly understood as an intertwined relationship between business, people, and the planet (6, 28). Corporate activities are (and will increasingly become) dependent on multiple core values, including being able to demonstrate success in stewardship of the biosphere (7, 29, 30). Voluntary commitments and tangible actions (by individual companies or groups of like-minded partners) illustrate that integrating such values has become a concern for some civil society actors, consumers, financial actors, shareholders, banks, and board members (31–33). The credibility of such actions rests on stakeholders being able to observe and verify these changes (through transparency or third-party verification), government enforcement, or reputation-based mechanisms (34).

Transnational corporations (TNCs)

made up of a group of companies, each of which has relatively large autonomy (where subsidiaries don't have autonomy, the group is referred to as a multinational corporation)

Reversing existing trends is crucial not only for humanity's future but also for the future viability of corporations, which ultimately depend on a functioning biosphere for their survival. When impacts are sufficiently problematic or when voluntary behaviors become standard expectations, government legislation of corporate activities has often followed. New legislation can also advance rapidly in light of new scientific knowledge (35, 36). National legislation, however, is premised on activities taking place in a nation, and the expected standards of performance (and related enforcement) differ between countries. Thus, corporations that operate in more than one country will be subject to different legal requirements, and no single state will have a full view of their operations. This poses a problem with oversight, given that large corporations influence (and are influenced by) political visions of a sustainable society, emerging corporate norms, new technologies or financial mechanisms, and formal governance (7, 29, 30, 37).

How then do we ensure that companies adequately reflect on, and renegotiate, their social contract, purpose, and identity? We identify missing mechanisms for accelerating existing developments and suggest approaches for strengthening the contribution that corporations can make for advancing corporate biosphere stewardship. In doing so, we aim to contribute to the academic discourse on environmental governance, while also attempting to support a practical discussion of means to align corporate activities and aspirations with the reality of biosphere limits (38, 39). Previous global attempts to formalize international governance of transnational corporations (TNCs) (40, 41) were both relatively easily undermined by private and state interests as well as, perhaps, being ahead of their time with respect to governing global commons. There is a need, however, to learn from these earlier experiences in order to construct adequate corporate governance for the sustainability challenge: We lay out what such a framework for TNCs would entail.

We provide numerous considerations that could be of relevance for governments interested in commencing work on drafting a legal text for an international global (and still hypothetical) "Convention for Transnational Corporations in the Anthropocene Biosphere." We acknowledge that this idea has been proposed previously, that earlier attempts by governments and United Nations (UN) agencies have failed to develop such an agreement, and that our suggestions are based on conceptual needs rather than detailed considerations of legal feasibility. However, given the urgency of the biosphere crisis, the slow speed of progress, and the importance of legislation and other formal governance mechanisms to support transformative change (28, 42, 43), efforts are needed to develop the technical, legal, and diplomatic foundations for such an agreement, if the SDGs are to be achieved. To enable transformative change, however, it is first necessary to understand the origins of global corporations.

2. ORIGIN AND GROWTH OF POWERFUL, GLOBAL CORPORATIONS

The trading companies of the sixteenth century are often described as the starting points for modern, globalized corporations (41, 44, 45). The oldest commercial corporation still in operation is Stora Kopparberg (29). This Swedish entity was established in the fourteenth century and was originally engaged in copper mining, but the company (now named Stora Enso) currently produces packaging, pulp, and other wood products, with 23,000 employees in 50 countries. Such centuries-old companies are, however, an exception, and it was not until the late nineteenth and early twentieth century that TNCs emerged as global nodes of power. This development was fueled by “discoveries of” petroleum, minerals, and foods, rapidly developing industrial capitalism, and associated factory production processes, as well as modern storage and transportation technologies (29, 44, 46). Historical patterns of colonization and land acquisition have strong overlap with corporate activities and associated headquarter locations (45). During the twentieth century, TNCs grew in power and influence, and although the resources that fuel their growth are derived from the entire world, centers of control and financial revenues are primarily concentrated in the Northern hemisphere (35, 44, 45, 47, 48).

The development of transnational and truly globally operating corporations accelerated after World War II (1939–1945) (29, 44, 46), on a planet characterized by an abundant, thriving, and resilient biosphere (38). Consequently, few concerns were raised in relation to the use of natural resources (35). This abundance was particularly evident for corporations that could relocate globally to where resources were accessible and plentiful. The resilience of the biosphere was largely taken for granted during this period in time. This postwar period starting in the mid-1940s was characterized by substantial deregulation and innovation (both logistical and financial)—primarily in countries that have since become members of the Organisation for Economic Co-operation and Development (OECD), founded in 1961. These changes increased the ability of firms headquartered in these parts of the world to achieve relative autonomy from their governments and establish greater control of their value chains (29).

The combined results were that corporations could seek to optimize their operations in a truly global context, by locating their activities in low-cost areas, reducing their logistics costs, lowering product prices, increasing demand, securing access to resources, and obtaining access to capital (29, 49). At the same time, the size of companies that were needed (and the financial resources they had available for investments in things like infrastructure) to support the emerging scale of economic activities resulted in the increasing emergence and dominance of TNCs. To what extent this development was driven by political ideals, or was the result of corporate lobbying, has been debated (29). What is clear, however, is that these changes were also paralleled by a mental shift and a change in norms associated with what a corporation was and what it should do. According to Sukhdev (29), corporations “ceased to have a social purpose” and instead focused on developing their “size, leverage, advertising and lobbying.”

The expansion of activities by TNCs in “developing” countries (50) has enabled TNCs to access new resources and has reduced costs for corporations, e.g., due to lower labor costs (49). Other means of minimizing costs include the use of tax havens (51), or manipulation of prices through intrafirm trading (41). Operating in developing countries often results in reduced performance expectations, and these countries often have less capacity to monitor and enforce compliance than the countries in which TNCs are headquartered (48). Developing countries have attracted TNCs as a means to mobilize critically needed financial, human, and political capital (41). The evidence on the effects of corporate activities in developing countries is mixed, with contradictory results suggesting, on the one hand, that activities are sometimes beneficial (by creating jobs, stimulating innovation and capacity building), while, on the other hand, being harmful for development

(leading to a deterioration of the environment, accelerating inequities, and creating relationships of dependence) (47, 48, 52, 53). These impacts are likely to differ substantially if industries are primarily focused on outsourcing production (e.g., in garment factories) or are mainly focused on natural resource extraction (e.g., mining) in the relevant country—with the latter activities closely linked to the “resource curse” that characterizes some resource-rich developing countries (54).

3. THE INTERTWINED NATURE OF CORPORATIONS, GLOBALIZATION, AND THE ENVIRONMENT

It can be challenging to assign causality between the diverse activities of a globally operating corporation and specific or local environmental impacts. It is also challenging to understand the power and influence of corporations (see the sidebar titled The Size and Economic Power of Corporations) in the complex and interconnected political and economic systems of globalization (40, 55). What is clear, however, is that corporations are having an increased prominence and impact on the biosphere (7, 28, 32, 56), and it is this wider role of TNCs, in particular, and the extent to which they are implicated in global environmental change that bring them to the attention of sustainability science (49, 57). This means that we are especially interested in TNCs with adverse social-ecological impact and/or where they might influence governance due to their size and the extent of their operations. The growth of TNCs reflects increased globalization (itself a characteristic of the Anthropocene) and has not been without complexity or controversy [e.g., the intertwined social-ecological-political dynamics involving the International Telephone and Telegraph company in efforts to defeat Salvador Allende in Chilean national elections to ensure access to copper resources (41, 58)].

Poor financial governance also has adverse impacts. For example, the financial resources needed to exploit (mineral) resources are often greater than what can be mobilized by an average sized (mining) company. The size and economic leverage of TNCs therefore provides a mechanism by which new resources can be identified and exploited. In these cases, estimates of mineral deposits have to be accurate and access to such resources has to be ensured in order to protect company investors. Inaccurate information about resources available to companies can lead to bubbles forming whereby prices for resources rise and then crash, which damages investors, local communities, and governments (59).

A range of industrialized sectors have been identified as directly related to some of the major biosphere challenges (4, 7, 53, 60), and it has been argued that financial leverage gave companies

Turnover: the sum of the value of all goods and services sold during a particular period by an organization

Value added: turnover less the costs of the goods that have been sold, and hence is a comparable corporate accounting figure to gross domestic product

Gross domestic product (GDP): the measure of the value of all final goods and services produced by a country

THE SIZE AND ECONOMIC POWER OF CORPORATIONS

Comparing companies' turnover and value added to countries' gross domestic product (GDP) illustrates the impact of using different figures when estimating corporations' economic power (all figures drawn from 2015–2016). Walmart is the largest company in the world, with 2.3 million employees, a turnover of \$485.9 billion, and a value added of \$17.3 billion. The Walmart turnover was approximately the same as Belgium's GDP (\$470 billion), making it appear as if Walmart is comparable to 103% of Belgium's GDP (suggesting they have the same economic power); however, this is an incorrect comparison because GDP is a value added measure and is not comparable to turnover. When correctly comparing economic power, namely Walmart's value added to Belgium's GDP, Walmart accounts for 3.7% of Belgium's GDP. This is not to say that Walmart does not wield economic power; rather, it is not valid to compare company turnover to GDP when assessing relative economic power.

Table 1 Three phases of corporate engagement in sustainability (inspired by 30, 35, and 159)

Time period and established corporate norm	Voice (of leaders)	Loyalty (to norm)	Exit (reality of laggards)
1990–2015 The environment is important; corporate social responsibility (CSR) policies are good to have.	Advocate for more ambitious sustainability approaches and the “triple bottom line.”	Say something about CSR; don’t do anything costly. Watch your surroundings, lobby against regulations.	Focus on compliance; CSR is a trend that will pass.
2015–2020 Coherent and ambitious sustainability policies [e.g., the United Nations Sustainable Development Goals (SDGs)] are instrumental for credibility.	There is a need to develop net-positive corporations that operate as responsible citizens.	Demonstrate credible commitment to CSR, set time-bound goals and targets, and report on progress.	The SDGs are too ambitious and unrealistic; our CSR policy and compliance is sufficient.
2020–2030 Corporate biosphere stewardship is emerging as a critical necessity for a moral license to operate.	Are we operating within a functioning system of capitalism?	Moving from compliance to conviction is instrumental for credibility. Corporations should be operating as global leaders for positive change for all people and ecosystems—reconnecting with social purpose.	Unsustainable and unhealthy businesses can choose to “exit with dignity” or innovate substantially.

the power to expand their activities in disproportionate ways, and with a focus on short-term gains, resulting in the biosphere being treated as an externality (29, 61). Companies are rarely forced to take into consideration the full social and ecological costs of doing business, given that they are generally not taxed for their environmental impacts (29). A focus on compliance only (as a means to minimize costs) has resulted in many corporations operating at the margin of existing legislation (29). Doing very little (and not investing substantially in providing common goods) has been a norm of corporate behavior for decades (30, 35) (**Table 1**).

TNCs are not a homogeneous group, but differ substantially in what they produce, their level of vertical integration, industry affiliation, competitive strategy, organizational complexity, and influence on the biosphere (62). Extractive industries produce products from either nonrenewable (mining, fossil fuels) or renewable (fisheries, agriculture, forestry) resources and can have severe negative impacts on the biosphere, particularly when improperly governed. Long-term benefits of environmentally responsible corporate actions are also inherently challenging to project or quantify, particularly in the case of extractive industries built around nonrenewable resources, and may primarily represent a cost for such corporations. Non-extractive TNCs, in turn (e.g., retailers like Walmart or Unilever), have less of a direct impact on the biosphere but are closer to consumers, which means that positive reputation is directly related to their short- and long-term profits. They are subject to reputational risks, when actors in their supply chains are involved in unsustainable or otherwise unacceptable behavior. Stewardship engagement may thus represent a way to manage risks, a way to stand out in relation to competitors, or an opportunity to reformulate an existing business model (62). To varying degrees, different industries are also able to switch suppliers and can exercise some level of control of actors in the supply chain that stimulates sustainable behavior, but they may also generate pressure for such actors to compromise wages or working conditions

to remain competitive. Fossil fuel companies, in turn, may be critically dependent on resources in a particular location. They are further away from consumers and public scrutiny, and have a long history of active misinformation, lobbying, funding politicians, and involvement in community conflict (63, 64).

The global nature and diverse impacts of corporations represent a challenge when assigning responsibilities for harm, and the adequate means for doing so. This is complicated by state sovereignty and how this principle plays out in corporate settings. Since 1648 and the advent of the Westphalian state system, the notion of state sovereignty has become an international norm, meaning that each state has the right to govern itself as it sees fit and no other state can interfere in the internal affairs of a state. This means that a country has the ability to govern only companies who are incorporated in that state (for a TNC, this is where their parent company head office is). If a subsidiary of a TNC is incorporated in another state, the home country does not have the right to dictate what rules the subsidiary must adhere to, and that country cannot obligate the parent company to do anything (65). The relationship between home and host countries is at the heart of the regulatory context in which TNCs operate and is the basis for concerns about TNCs, how they are governed, and their global sustainability impacts. These norms, however, are evolving rapidly, and corporations are becoming subject to more cross-country regulatory forces.

Not only is the world increasingly turbulent when it comes to rapid change in ecosystems and the dynamics of the financial and climate systems (23, 66), but also there appears to be an increasingly dynamic relationship between corporations, the formal and informal norms that govern them, and the biosphere (7). Expectations of corporations are changing, and there appears to be growing political and public interest and attention to how corporations treat the biosphere (30). This attention has stimulated an increased formalization of governance of corporate activities, but it has taken seven decades of increasing recognition of the environmental challenges associated with private corporations to get to this point (10, 29, 35, 49, 52, 56).

In the following, we illustrate how corporations have entered a transitional period in which narratives are increasingly shifting from simply complying with existing regulations to also engaging with sustainability as a conscious and credible strategy (26). We explain, moreover, that, in some instances, leading companies have started to identify pathways that can transform their business model altogether (30, 37) (**Table 1**). The question is, How did we get here?

4. GROWING ATTENTION TO HOW TRANSNATIONAL CORPORATIONS TREAT THE BIOSPHERE

Natural resources from the biosphere represent a basis for corporate revenues, and although negative impacts of corporate actions are numerous and periodically reported in particularly egregious instances (see the sidebar titled *When It All Goes Wrong*), they have not received the sustained scientific attention or public scrutiny that they deserve. Consequently, knowledge about the links between corporations and the biosphere is limited. However, the interest in negative corporate impacts has been increasing as a consequence of both short-term shocks and longer-term disturbances (4, 10, 29, 30). Notable crises that have increased public attention to private corporations and the biosphere include the 1984 Bhopal catastrophe, the 1989 Exxon Valdez Oil Spill, and the 2010 British Petroleum Deepwater Horizon explosion (see 19, 29, and the sidebar titled *When It All Goes Wrong*). These crises have underscored the substantial negative impacts on human health and ecosystems from irresponsible corporate action but are all dwarfed by the existential and global crisis associated with greenhouse gas emissions (4, 56).

One of the first times since the Great Acceleration (38) that widespread public attention was focused on a specific industry was during the 1960s, focusing on pesticide producers (35). The

Parent company: company that controls numerous subsidiary companies that are combined to represent a group

Home country: the country where a transnational corporation is headquartered

Host country: a place where a transnational corporation operates

WHEN IT ALL GOES WRONG

The 2010 blowout of BP's Deepwater Horizon well in the Gulf of Mexico killed 11 workers and resulted in the worst oil spill in United States history—with more than 12 times as much oil released into the environment as the Exxon Valdez in 1989 (67). Drilling at depth comes with a wealth of safety issues, with one analysis finding that “incidents” such as spills and worker injuries increase by 8.5% for each 100 ft of depth (68). Located 4,130 ft deep, the Deepwater Horizon was therefore at high risk among the Gulf's 1,862 platforms (69).

The blowout was a combination of malfunctioning safety features, human error, poor regulatory decisions, lack of knowledge (no high-resolution map of the Gulf's seafloor existed prior to the drilling of thousands of wells), and that the same governmental agency [Minerals Management Service (MMS)] was responsible for issuing leases, collecting revenues, and enforcing regulations and safety measures. The MMS was disbanded after the accident and its responsibilities subsequently redistributed among separate agencies (67). For nearly 20 years leading up to the Deepwater Horizon spill, the MMS sought to implement reforms mandating that all operators have plans in place to address safety and environmental risks, but the industry has been described as serving as an impediment to MMS reform efforts (67). At the same time, the industry was rapidly expanding, with a 71% increase in drilling permit applications from 2005 to 2009 (from 1,246 to 2,136), making regulators unable to keep pace (67). With inadequate regulatory resources, unannounced site visits plummeted, and the government's oversight rapidly diminished exactly as riskier and deeper drilling operations began increasing. Unethical behavior (including acceptance of gifts) by some MMS staff overseeing operations in the Gulf of Mexico was also identified in 2010 (67).

Ultimately, the Deepwater Horizon spill also had a significant impact on BP, the operator of the well. At the time of the accident, BP was the world's fourth largest company (67). Fines, civil and criminal litigation, and other legal settlements have cost BP more than \$65 billion to date, its reputation is still closely linked to the accident, and it is currently the world's 357th largest company.

increased attention to human and animal health risks associated with chemical compounds like polychlorinated biphenyls and dichlorodiphenyltrichloroethane resulted in national legislation in the 1970s, although the global Stockholm Convention on Persistent Organic Pollutants was not signed until 2001 (70). Aerosols subsequently become an issue due to the scientific discovery of a large decrease in stratospheric ozone levels in Antarctica (71), later known as “the Antarctic ozone hole” (36, p. 46). In this case, the scientific realization of the existential risks associated with aerosols, and an industry willingness to phase out such chemicals, resulted in global regulations already being in place by the mid-1980s (72). The resulting Montreal Protocol, and the role of science and industry in that process, has been substantially covered elsewhere (see, e.g., 36). Deep-sea fishing and whaling became prominent conservation issues during the 1970s—as a result of both increasing geopolitical tension between coastal states (73) and public attention to whales and whaling (74). Oil transport at sea was also receiving substantial attention during the 1970s, and these activities were globally addressed by the 1984 UN Convention on the Law of the Sea and associated legal instruments (72).

The 1980s and 1990s saw an increase in attention to agriculture, including meat production and animal welfare (35). Key concerns included how the chemical industry developed pesticides that led to the pollution of soils, waterways, and the air, or how commercial seeds resulted in the loss of traditional varieties and other negative effects on people and biodiversity (53, 57). Numerous mergers between pesticide and seed companies during the 1990s resulted in farmers becoming dependent on commercial products and a small number of crop variants, pesticides, and corporations (53). Forestry and forest products subsequently entered the spotlight, in part as a consequence of concerns in relation to loss of tropical forests (e.g., in the Amazon) (35, 75,

76). Formal attempts to reconcile conservation and the sustainable use of biodiversity include the Convention on Biological Diversity and associated agreements, whereas informal attempts include multiple market-based mechanisms (**Table 2**; see relevant web pages in **Supplemental Table 1**).

In recent decades, increasing attention has focused on palm oil plantations, and other forms of degradation of tropical ecosystems (29, 77), abuse of labor rights (78), a renewed focus on animal welfare and meat (57) (and seafood) production and consumption, as well as a range of ocean-related issues (19, 79). Recent years have also generated a rapidly growing attention to, and engagement with, the crisis associated with climate change (4, 80–83). Concerns associated with global equity and a more fundamental criticism of the system of globalization have become evident (55, 84, 85) and are likely to continue to influence the perception and legitimacy of TNCs, as well as the system in which they operate.

When companies produce different goods and services, they often generate negative environmental or social impacts (31) (**Table 2**), but some of these impacts are not evident until years or decades later. Government regulations may be put in place to compel companies to internalize these externalities, or penalize companies if they fail to do so. Yet effective public policy requires functional institutions, an ability to enforce regulations, and awareness of the scale and extent of relevant externalities (31). Public policy development and implementation is particularly challenged by the swift, unpredictable, and transnational nature of Anthropocene dynamics (6, 28).

Existing environmental conventions, such as the Montreal Protocol or the Kyoto Protocol (**Table 2**), have implications for corporations, given that they have introduced ideas and approaches that were not in use prior to their establishment (72). New legislation has been driven by scientific discovery, public concerns, technological advances, and expansion of resource extraction into new places. International and global governance efforts provide foundations for more detailed regulations by nation states—they are consequently shaping formal norms. The time period required to develop adequate regulation may, however, be poorly matched to the scale and speed of the problem it aims to address (86, 87). Despite the substantial scientific knowledge associated with climate change, global formal governance has (**Table 2**) been insufficient to mitigate or reverse existing negative trends. This inertia is in part a result of limited political will, but it is also a consequence of corporations attempting to discredit science and lobby against regulations (9, 88, 89). Similar observations of effective corporate lobbying against formal regulations have been observed for companies engaged in food production (90).

Corporations continue to be responsible for social and environmental harms and this affects the views of governments and the public about which of these harms they are responsible for and how these responsibilities might be enforced. Beyond the question of how evolving legal obligations will compel companies to adopt new forms of behavior, expectations about what companies may “owe” society also shape corporate behavior. The idea that there is a social contract or a social license to operate between companies and society underpins this relationship. This contract is not stable, is varying over place and time, and is influenced by the actions of companies (who try to shape societal expectations) and society (most usually through campaigns and boycotts of corporations) (26, 49, 57, 91).

At times, ruptures in this social contract can have significant impact on expectations of what is acceptable corporate behavior that translate into new legal requirements. At other times, accidents have led to previously unappreciated risks crystalizing, leading to changed rules of conduct for an industry. In other instances, accidents result in fines and sanctions (see the sidebar titled *The Moving Landscape of Crisis: The Case of the Oil and Gas Industry*). An awareness of such poor corporate behavior, combined with novel communication technologies in an increasingly connected society (92), is stimulating demands for increased transparency to be able to assess how companies influence the biosphere (6, 7, 92). These demands have been coupled with a global

Table 2 Sector, sustainability impacts, and examples of governance, with year of establishment (see relevant web pages in Supplemental Table 1)

Sector	Impact (7, and references therein)	Formal governance	Informal governance
Agrochemicals	Water contamination, biodiversity loss, acidification	The Stockholm Convention on Persistent Organic Pollutants (2001)	Responsible Care (1985)
Fossil fuels (oil and gas)	CO ₂ emissions, deforestation, loss of biodiversity, contamination of air and water pollution, oil spills, hazardous waste	United Nations Framework Convention on Climate Change (1992), Kyoto Protocol (1997), Paris Agreement (2015)	Carbon Disclosure Project (2000), Extractive Industries Transparency Initiative (2003), Roundtable on Sustainable Biomaterials (2007), Divestment campaigns (emerging during 2011–2012), Science Based Targets initiative (2015)
Minerals and metals (gold, diamonds)	Habitat destruction, air and water pollution, loss of biodiversity, noise, waste accumulation	Not applicable (NA)	International Council on Metals and Mining (2001), Equator Principles (2003), Kimberley Process (2003)
Agriculture, livestock, plantations (palm oil, soybeans, coffee, bananas)	Biological diversity, habitat loss, water use and pollution, disease, waste	Ramsar Convention (1971), Convention on the Conservation of Migratory Species of Wild Animals (1979), Convention for Biological Diversity (1992)	Roundtable for Sustainable Palm Oil (2004), Roundtable on Responsible Soy (2006), Better Cotton Initiative (2009), Global Roundtable for Sustainable Beef (2011)
Forestry	Biological diversity and ecosystem function, habitats, climate change, water cycle change, pollution	European Union Forest Law Enforcement, Governance and Trade Action Plan (2003)	Forest Stewardship Council (1993)
Fishing and aquaculture	Loss of biodiversity, ecosystem function and habitats, water pollution, antimicrobials	United Nations Convention on the Law of the Sea (1982), United Nations Fish Stock Agreement (1995)	Marine Stewardship Council (1997), Aquaculture Stewardship Council (2010), Seafood Business for Ocean Stewardship (2016)
Shipping	Pollution, introduction of invasive species	International Maritime Organization (1948), and in particular the Ballast Water Management Convention (2004)	Sustainable Shipping Initiative (2010)
Animal pharmaceuticals	Antimicrobial resistance, human health	NA	Code of Pharmaceutical Marketing Practices (2006), Pharmaceutical Supply Chain Initiative (2006), Davos Declaration on Combating Antimicrobial Resistance (2016)
Seeds	Undermine local practices, decrease diversity and reduce resilience	NA	

THE MOVING LANDSCAPE OF CRISIS: THE CASE OF THE OIL AND GAS INDUSTRY

In 1988, the Piper Alpha platform (operated by Occidental Petroleum in the North Sea) exploded, killing 167 workers. The subsequent inquiry resulted in wholesale changes to the United Kingdom's offshore safety regime, including rig design, legal approvals processes, as well as the culture of the industry with respect to health and safety. In 1989, the Exxon Valdez tanker struck a reef and discharged approximately 10.8 million US gallons of crude oil into Prince William Sound, Alaska. Several factors contributed to the grounding (including malfunctional navigational tools), and the disaster resulted in the International Maritime Organization creating marine pollution prevention rules. In 1995, Shell, who operated the Brent Spar (an oil storage and tanker-loading buoy), had the legal permission from the UK Government to dispose of the structure at sea. Despite this action being legally sanctioned, NGO (nongovernmental organization) and consumer action resulted in Shell changing its decommissioning protocols. This case also influenced the Convention for the Protection of the Marine Environment of the North-East Atlantic. Oil and gas exploration in the Ogoniland region of Nigeria has been beset with conflicts arising between the state and protestors. This culminated in the execution of nine activists in 1995, leading to accusations of human rights abuses. Shell Nigeria has been subject to considerable pressure from international NGOs (among others) with respect to their responsibilities in the face of these problems. The Piper Alpha platform led to a changed legal regime, the Exxon Valdez resulted in changes to conventions, as did the Brent Spar, which along with the incidents in Nigeria caused reputational damage to Shell, and questions about their moral license to operate. For further information on the oil and gas industry, see the sidebar titled When It All Goes Wrong.

trend toward more comprehensive and transparent corporate reporting, including by using the Global Reporting Initiative (GRI) standard.

Sukhdev (29) argues that corporations have historically been able to gain and maintain power, agency, and autonomy—and a moral license to operate—in part as a result of manipulating societal perceptions. Professional communication has enabled TNCs to control their own narrative by employing a range of strategies (26), including corporate social responsibility (CSR) strategies and environmental, social, and governance (ESG) reporting. The engagement in strategies and communication has changed over time: In 2011, 20% of the 500 largest companies listed on the US stock exchanges had annual sustainability reports, but by 2017, 85% of them were producing such reports (93). How can governments ensure that increased communication is also paralleled by behavioral changes?

5. STATE-BASED REGULATION TO ADDRESS NEGATIVE CORPORATE EXTERNALITIES

A country can regulate the activities of corporations that are headquartered in its state, as well as all activities that take place on its territory. This mode of operation was challenged, however, during the 1970s, when various attempts were made to moderate the effects of TNC operations—with varying degrees of success. All were attempts to ensure that TNCs operate responsibly across the globe and are not able to use their power and the gaps in governance created by state sovereignty to create adverse effects, especially on low-income countries.

The OECD led early attempts to provide more general regulation of TNCs during the 1970s. The first OECD Guidelines for Multinational Enterprises (94) were developed in 1976 alongside other instruments to address bribery and transfer pricing (moving profits to lower tax jurisdictions). These guidelines apply to companies headquartered in OECD countries, with numerous non-OECD states also adopting responsible business conduct standards. Signatories (currently 50 governments) have a legal obligation to set up a National Contact point (since 1984), where

any complaints about nonobservation of the Guidelines can be made. Complaints are a nonjudicial grievance mechanism that supports mediation and conciliation between parties, and the OECD maintains a searchable database of complaints. The OECD guidelines thereby create a set of expectations about what good corporate behavior entails, covering topics such as human rights, employment practices, and bribery and also include expectations about environmental impacts. Many of these principles and practices are similar to those adopted by the United Nations Global Compact (UNGC) (95).

The environment chapter of the OECD guidelines is process oriented and requires companies to comply with laws and regulations; have some system of environmental management; provide information to employees on health, safety, and environmental aspects; address environmental concerns in decision making; understand risks from a scientific perspective; have contingency plans; seek to improve environmental performance; educate workers; and contribute to sound public policy. These nonbinding guidelines have not been updated since 2011 (94), which means that they are not taking into account recent scientific advances in relation to the biosphere crisis. Moreover, even in the updated version, the basis for expectations of behavior is more dated. For instance, paragraph 60 of the Guidelines notes the following:

The text of the Environment Chapter broadly reflects the principles and objectives contained in the Rio Declaration on Environment and Development, in Agenda 21 (within the Rio Declaration). It also takes into account the (Aarhus) Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters and reflects standards contained in such instruments as the ISO Standard on Environmental Management Systems (94, p. 44).

There is consequently substantial scope for further revision of the OECD guidelines to also incorporate more recent scientific understanding of Anthropocene risks.

In the 1980s, there was a failed attempt to develop a UN-sponsored “Code of Conduct on Transnational Corporations” (96), itself started around the same time as the OECD Guidelines for Multinational Enterprises. The UN attempt proved a difficult undertaking (97), which was from the outset deeply political as it was rooted in trade and foreign investment concerns and informed by the 1970s oil shocks. Although there was broad agreement on corporate standards (and evidence of their functionality in the form of the OECD codes), the proposals challenged norms of state responsibility and hence state sovereignty (97), even though these standards were billed as an instrument of persuasion rather than being binding. Although corporate lobbying is thought to have scuppered the code (32, 33, 36), others argue that changing geopolitical contexts, the loss of powerful champions for the code, and the rise in market ideologies (97) also contributed to the failure of this attempt. This does not imply that expectations of corporate behavior have remained frozen in time, or that industry bodies have failed to champion certain norms of corporate behavior.

The process of ensuring global oversight of TNC behavior has been developed further in recent times under the leadership of John Ruggie (who from 2005 to 2011 was the UN’s Special Representative on Business and Human Rights and who also was one of the architects of the UNGC and the Millennium Development Goals). There are two reasons for the success of the nonbinding UN Guiding Principles on Business and Human Rights (championed by Ruggie, agreed in 2011, and commonly referred to as the “Ruggie Framework”). First, there is much deeper commitment by governments in the area of human rights standards, and hence it is easier to develop principles in this area. Second, the framework provides a division of duties among governments and TNCs, namely through a state duty to protect human rights, a corporate responsibility to respect human rights, and provision of access to an effective remedy by those whose human rights have been affected (a joint state and company responsibility). In this way,

the primary responsibility for human rights still rests with states, with corporations having a contributory role in ensuring human rights are realized in their business activities (98).

6. VOLUNTARY ACTIONS FOR ENVIRONMENTAL STEWARDSHIP

Companies that perceive themselves as leaders or good actors may see benefits in effective and consistent regulation that codifies similar norms among industry peers, creating a “level playing field.” Where such mechanisms are not in place, the reputations of entire industries can be undermined by a handful of companies acting irresponsibly (99). Such contexts have proven particularly fertile ground for the emergence of private (informal) governance approaches (see **Table 2**) such as voluntary environmental programs (VEPs)—often referred to as green clubs—vehicles of precompetitive collaboration that bring together companies behind commitments to voluntarily go beyond compliance with minimum legal regulations, and push for greater accounting for externalities in their operations (100).

Civil society organizations have played an important role in advancing corporate sustainability initiatives (40) and, in particular, market-based and voluntary efforts (101, 102). Public naming and shaming of public-facing brands has been an effective form of environmental activism [in countries and places where nongovernmental organizations (NGOs) are operational and active (40)], although the popularity of these tools waned after many NGOs became collaborators with (and recipients of funding from) TNCs (40, 75, 101, 103). Several prominent examples of such cooperation are related to labeling. The first stewardship labels were created in the 1970s and were related to eco-labeling (104). The “dolphin-safe” logo for tuna was established in the United States in 1990 (19, 103), and the Forest Stewardship Council, established in 1993, is an international certification scheme for wood products (75, 101). The Marine Stewardship Council is an international certification scheme for capture fisheries that was established in 1997 (19, 105). A suite of environmental certifications followed with the goal of allowing consumers to exert their values over international supply chains of production. However, the demand for eco-friendly products has been greater than supply, and many certification schemes have been criticized for weak standards and overly lenient third-party certifiers (106).

The broad appeal of VEPs is reflected in their tremendous diversity across topical issues, industries, and geographies (**Table 2**). In addition to product labeling, they also include other standards, including the global ISO 14001 standard (99, 107), reporting approaches (the GRI, the Carbon Disclosure Project, or the Science Based Targets initiative), and different principles, such as the Principles for Responsible Investments or the Equator Principles (108). Several international business coalitions (not least, the UNGC, with >10,000 members) have also emerged and generated general guidelines and approaches, including WeMeanBusiness and The World Business Council on Sustainable Development (WBCSD). Numerous “business roundtables” are attempting to address topic- or sector-specific sustainability issues, such as the Round Table on Responsible Soy and the Roundtable on Sustainable Palm Oil (75, 77, 101, 102) (**Table 2**).

Although diverse, VEPs often share some common aspects: most have a director to manage operations, an executive board to shape vision and direction, a council for gathering member input, and associated advisory or expert bodies (109). VEPs are largely shaped by two sets of rules: those associated with the obligations of membership (standards) and those associated with the monitoring and enforcement of those obligations (sanctioning mechanisms) (100). Where membership rules are stringent and strong sanctioning mechanisms exist, VEPs are unlikely to have free-riders but are likely to carry considerable costs for members (110). Likewise, a VEP with lenient membership standards and little or no sanctioning of members is likely rife with free-riders and carries minimal costs for members (110) (**Figure 1**).

MEMBERSHIP STANDARDS	SANCTIONING MECHANISMS		
	Weak (little or no sanctioning)	Medium (reprimand/expulsion without public disclosure)	Strong (public disclosure of reprimand/expulsion)
Lenient	Risk of free-riding: HIGH Branding benefits: LOW Membership cost: LOW	Risk of free-riding: MODERATE Branding benefits: LOW-MODERATE Membership cost: LOW-MODERATE	Risk of free-riding: MODERATE Branding benefits: LOW-MODERATE Membership cost: LOW-MODERATE
Stringent	Risk of free-riding: HIGH Branding benefits: LOW Membership cost: MODERATE-HIGH	Risk of free-riding: MODERATE Branding benefits: MODERATE Membership cost: MODERATE-HIGH	Risk of free-riding: LOW Branding benefits: HIGH Membership cost: HIGH

Figure 1

Different sanctioning mechanisms and membership standards lead to various outcomes in voluntary environmental programs. Figure adapted with permission from 132.

Assigning causality to changes in action is a fraught activity, but where broad objectives have been stated, decades of evidence have been collected in some cases to identify impact or lack thereof from corporate sustainability efforts (111–113). Empirical studies on the effectiveness of VEPs and CSR policies find mixed evidence on social and ecological outcomes. Whereas some assessments of environmental effects of VEPs (with a focus on pollution) conclude that VEPs had a significant positive impact (114–117), other studies concluded that they had no significant ecological impact (118–124).

In 1985, for instance, chemical industry actors established a VEP (Responsible Care) with a primary focus on advancing health, safety, and environmental impact (Table 2). Yet one analysis found that the VEP had delivered no impact on reducing pollution and lacked sanctioning mechanisms that may have been able to deliver such impact (121). Likewise, the National Ski Areas Association established the Sustainable Slopes VEP in 2000 to promote sustainable practices, yet an analysis found that environmental behavior by ski resorts and their membership in the VEP were uncorrelated (125). Elsewhere, an analysis of corporate reporting on plastics use and pollution found that membership in green clubs correlated with pre-existing high levels of reporting on plastics, suggesting that green clubs attract leaders seeking to further bolster their credentials rather than laggards seeking to define new priority actions (126).

Various reasons might explain these mixed results on effectiveness. First, VEPs and CSR initiatives can take various forms, have different degrees of maturity, and be significantly different in their design, governance framework, stringency, and enforcement approach (127). Second, the differences in the evaluation might be caused by a lack of comparative baseline data that could be used for an effectiveness assessment (128).

Moreover, assessing the impact of VEPs is notoriously difficult, as they never operate in isolation but, rather, within the context of existing industries and regulatory landscapes, populated not only by companies but also civil society actors (19, 111, 112). Generally, however, VEPs are thought to have influence across three areas:

1. Standardization of norms (if the VEP defines shared standards for what constitutes appropriate behavior or practice)
2. Creation of platforms for exchange (if the VEP involves regular meetings and exchange among members)
3. Regulatory impacts (if the VEP has some level of monitoring and enforcement and associated sanctioning mechanisms for compliance with defined commitments) (110)

Various mechanisms impact the success or failure of a program. First of all, VEPs offer the possibility of developing institutional norms and practices and increased institutional learning, in particular if organizations participate in more than one VEP. Participation in multiple VEPs might indicate the organizational commitment to better ecological or social practices and often leads to the adoption of more sophisticated CSR standards and practices (129). Secondly, internal organizational dynamics often strongly influence participant behavior (130), and market pressures (e.g., through consumers, suppliers, trade associations, or responsible investors) have been observed as being more effective at leading to positive change beyond compliance in comparison to nonmarket pressures such as state regulation.

The effectiveness of a VEP or CSR initiative is influenced by the legitimacy of its standards and the coverage provided (131), with the literature arguing that a higher coverage and larger participation numbers are advantageous in attracting new members but also open up opportunities for free-riders (99, 132). Lastly, the level of trust, collaboration, clear communication of intentions, and commitment to action between the actors involved influence the outcomes of a VEP (77, 133), indicating that higher levels of trust and information sharing between participants can lead to better outcomes of voluntary CSR initiatives.

7. WHERE ARE WE HEADING?

CEOs may struggle to reconcile what is most profitable for the company and what is best for society or environmental stewardship (**Table 1**). Corporations have a global reach and are dependent on functioning ecosystems, their supply chain connections, consumers, and reputation. It is mainly up to national governments to ensure that corporations are complying with the law, but they also appear to be struggling to identify policies that can adequately govern corporations in the Anthropocene—when the relationship between globally operating corporations, nationally constrained governments, and an interconnected biosphere is under strain. The inability of governments to agree on a set of global standards for corporations, combined with limited transparency and knowledge of impacts, has resulted in a governance gap where sector-specific regulations and a focus on voluntary measures appear ill-suited to comprehensively remedy the biosphere challenges. How then do we get corporations to care about larger outcomes than the company's bottom line? Can a mix of public and private, voluntary, and enforced governance mechanisms (77, 100–103, 110) halt and reverse existing trends?

7.1. Global Risks and New Opportunities

Multiple new incentives are starting to shape corporate strategy and action. Some of them are influencing traditional values in companies, whereas others are exploring new (or at least revised) complementary corporate values. For instance, new financial mechanisms (such as sustainability-linked loans) and price premiums on lending or insurance when including sustainability criteria are attempting to streamline sustainability activities in corporate activities with direct financial incentives (32, 33). Stricter ESG-related stock listing requirements, climate-related financial disclosures, new mechanisms for full cost accounting, and demands from pension funds and consumers are setting new barriers to entry for companies to operate if they are unable to credibly demonstrate that they are engaging with sustainability and a healthy planet (7, 29). New technologies to advance traceability and transparency are creating new risks and opportunities for companies who have not taken social and ecological issues seriously (134, 135). Combined, these mechanisms are likely to generate increased pressure on companies, who are likely to (at least) continue to marginally tweak and improve their reporting and performance.

In this dynamic reshaping of corporate priorities through financial incentives, there is also an increased attention to global inequalities and downsides associated with a globalized world of depleting natural resources (136), as well as where the distance between the wealthy and poor (both within and between nations) is increasing (84). Social movements are advocating for a stronger focus on social equity, climate justice for current and future generations (82), and a fundamental rethink of the entire global and capitalist system. A focus on degrowth and alternative systems of sharing economies appears distant from the current status quo, but history has illustrated that revolutions and other large-scale social changes have been the result of increasing inequalities (137). A focus on equity and alternative economic systems is likely to generate increasing pressures on corporations to innovate and change in order to maintain their license to operate. In the following, we speculate on three different potential pathways of change, which acknowledge the need for transformative change, and the complexities and inertias associated with most social change. We refer to these as (a) continued tweaking, (b) transforming corporations, and (c) transforming the system in which TNCs operate.

7.2. Continued Tweaking

Many corporations now employ GRI reporting and are integrating the SDGs in their strategic action plans and target setting. An increasing number of corporations are also setting their own (often insufficient) climate emissions reduction targets (138) and many in the finance sector are working with ESG systems, where there is substantial need for improving both precision and accuracy in relation to declared sustainability ambitions (32). This continued tweaking may result in improved and accelerated corporate actions in relation to sustainability, but given the urgency of the biosphere crisis, with escalating climate change (20), loss of biodiversity (21), and reduced biosphere resilience (139), it will likely not be sufficient.

A growing minority of corporations are not integrating CSR into their operations; instead, their business model is prosocial and their product is to advance social or ecological sustainability (30, 37, 140, 141). There are thus indications that the logic is starting to change for what a corporation is or should be (Table 1). A key question is whether or not such innovators are powerful enough to influence the existing corporate logic (30), if advances in corporate governance, novel technologies (28, 134), new models of full cost accounting (2, 28, 29, 136), elimination of subsidies (142, 143), reconnection with social and ecological purpose, legislation directed at lobbying, and advertisement (29), or new models of taxation (51, 144), will be sufficient to stimulate a transformation toward sustainable futures. Will more radical change be needed to achieve sustainability?

7.3. Transforming Corporations

There seems to be a growing paradox in the corporate world today, with profits and investments having never been higher, but with environmental degradation never more severe—and a rapid growth of inequality. However, although corporate engagement in biosphere stewardship only a few years ago was seen as an economic burden, it is today inspiring new purposes and meanings, shaping values and culture in the direction of sustainable futures, and is increasingly applied as a pathway to novelty, competitiveness, recruitment of talent, and progress among companies and investors. This is evident in cross-company collaborations like the UNGC, the WBCSD, the European Automobile Manufacturer's Association engaging the world's major truck companies in phasing out fossil energy, or Seafood Business for Ocean Stewardship—with ten of the largest transnational seafood companies acting on time-bound goals for social and environmental sustainability (145). These changes seem to be part of a broader societal shift of the need for a deliberate,

fundamental cultivation of emergence to enable transformation toward better futures in order to avoid a deepening of a system that ultimately is worse for all (146, 147).

Examples of ways that corporations engage in stewardship include developing alternative business models (sharing, rental, or second-hand products) to maximize materials efficiency, producing substitutes to existing products (e.g., alternative meat), using waste to generate new products and values (recycled plastic for new clothes), focusing on longevity (and repair) of products (and encouragement of reduced consumption), and striving to maximize their social purpose rather than profits (148). At the same time, there is innovation regarding the corporate form itself with the recent rise in Benefit Corporations (some of which seek to become “BCorps” by way of certification of their activities by the B Lab).

BCorps emerged in the United States in response to the financial crisis in 2008 as well as the belief that corporate law in that country restricts responsibility actions due to the primacy of shareholders in corporate governance. Although shareholder rights are found in all jurisdictions, the United States has historically been more narrowly focused on shareholder returns. BCorps, therefore, is a separate legal designation for a “for-profit, socially obligated, corporate form of business, with all of the transnational corporate characteristics but with required societal responsibilities” (149). At the time of this writing, 3,887 Benefit Corporations have been certified across the globe. Some 62% of these companies were headquartered in Australia, Canada, the United Kingdom, and the United States. The majority of them are smaller entities, but TNCs are eligible to become BCorp certified. BCorps include publicly traded companies as well as privately held companies (150). BCorps remain a minority form and do not currently appear to be engendering larger-scale shifts in corporate purpose.

The next decade will require large-scale and substantial change in the human relationship with the planet (28). Assuming that the companies of today will not radically innovate and create entirely new markets and products that are decoupled from environmental and social impact, we explore ways in which they can initiate the necessary transition from having net-negative impacts to net-positive impacts. We therefore assume that the world economy will not radically change from the existing growth paradigm. Our suggestions are based on experiences derived from working with corporations across sectors in a Swedish and UK context, and collaboration with the global seafood industry (see the Author Contributions statement). These “five easy steps” focus on transforming corporations and are inspired by the scientific and business literature, including, e.g., the Dasgupta review (2) and work by P. Sukhdev, J. Elkington, and K. Raworth (29, 30, 37). They all assume that corporations (their owners, boards, CEOs, and staff) are interested in exploring additional values than profit, and that they realize that creating multiple values is in their long-term interest:

1. Clarify the “why”: What is the vision of the company in relation to the biosphere, and what agency does it have to influence the planet? What is needed to become an active steward? Reconnect to social purpose and the core legacy of the corporation and clarify and realize the benefits of acting for the common good for the corporation and for society at large.
2. Ensure compliance in one’s own operations and in supply chains throughout all levels. Focus on transparency and traceability, legal compliance and getting the basics right, using disclosure to contribute toward correcting imperfect markets. Pay taxes/fair wages and employ full cost accounting.
3. Advocate for positive change and engage in precompetitive work with like-minded companies to lobby for stronger and better regulations and improved monitoring of compliance, and develop incentives to stimulate large-scale change and innovation across sectors toward biosphere stewardship and sustainable futures.

4. Explore and advance the leading edge through collaboration by setting bold climate emissions reduction targets, setting ambitious goals for removing negative impacts, and creating positive social-ecological change, guided by science and in cooperation with peers. Partnership is the new leadership. Discover, invent, and invest in new emerging business opportunities that will contribute to sustainable futures within planetary boundaries.
5. Become an active biosphere steward and support transformative change alone or in partnership with other companies, with NGOs, or with science. Innovate and embrace complexity, uncertainty, and surprise and develop strategies and actions that contribute to strengthening the resilience of the biosphere to sustain development with critical ecosystem services, including climate regulation and buffering the effects of extreme events. Develop ways to support and accelerate a global movement of change toward corporate biosphere stewardship—shepherding and safeguarding the resilience of the biosphere for human well-being.

A key question is whether such suggested changes can be sufficiently sincere, ambitious, and fundamental—and if corporations are able to integrate biosphere stewardship at scales and speeds that are sufficient to effectively address the biosphere crisis—or if strategies and reporting associated with sustainability simply represent a new opportunity for TNCs to adapt a new language and marginally revised approaches that create competitive advantages and attract new investors and markets (49). Previously expressed concerns with corporations engaging in green- (151) or bluewashing (95) have generated substantial skepticism in relation to how serious and ambitious corporate activities in relation to the biosphere actually are. Such skepticism is further fueled by information of corporate lobbying against regulations (9, 57, 152), strategies for reducing the legitimacy of climate science and scientists (89), and perceptions of corporations as “psychopaths” (46, 153). Ambitious policies developed by corporations can look good on paper, but rapidly become translated into business as usual (154). How then do we ensure that companies are adequately integrating stewardship as a core business value?

7.4. Transforming the System in Which Transnational Corporations Operate

To ensure that corporations contribute to the identified social and political goals of sustainability requires the identification and implementation of a progressive “playing field” where combining actions by corporations with effective public policies and improved governmental regulations could substantially accelerate sustainability efforts. Historically, corporations have been granted the privilege from relevant states to operate within a particular domain of business, and in some cases they were even granted a monopoly position to do so (45). These privileges were granted in an era when global resources were widely abundant and the biosphere was resilient to human actions. These historical privileges were preferentially awarded to companies that could advance the interest of the state, whether it was associated with facilitating colonization, establishing new or improved trade relations, or advancing other political interests (45). Corporations have consequently been deeply connected with political affairs, and the current world order rests on this legacy (41). Given that companies have historically operated with a mixed motive as specified by governments (advancing political interests and making profits), and that biosphere resilience can no longer be taken for granted (24, 139), perhaps it is time for governments to ensure that company motives and purpose are aligned with political and societal interests and economic preconditions—namely to safeguard the resilience of the biosphere for future generations.

There is growing social and political pressure directed at TNCs and, in particular, fossil fuel companies. Examples include the divestment movement (see **Table 1**) and an increasing number of court cases related to climate change (155).

TNCs (alone, or in cooperation with their peers) cannot be the sole engine of transforming the system (and existing evidence suggests that they are not capable or incentivized to play this part). Hence, a broader system shift toward just and sustainable futures is needed, where governments take on a leadership role, through the development of formal regulations. One way for governments to clarify the motive and purpose of corporations would be to formally grant privileges to companies that can credibly demonstrate that they are operating in line with the function of the planet, and that they are able to serve this new (or at least revised) public purpose (45) and public interest (53)—with an ambition of becoming corporate biosphere stewards (7). We believe that the time is ripe for a “Convention for Transnational Corporations in the Anthropocene Biosphere.” Such a convention could provide framed creativity (156), incentives for governments to implement regulation and policies, as well as international support and sanctioning for a rapid transformation of corporations in the service of biosphere stewardship.

7.5. Imagining a Convention for Transnational Corporations in the Anthropocene Biosphere

There are two complementary bases from which a convention for governing TNCs in the Anthropocene might emerge. First, the OECD Guidelines demonstrate that a framework can be developed alongside a mediation process that allows for problematic TNC operations to be highlighted and addressed. Where these guidelines fall short is in their framing of environmental issues that reflect a much earlier scientific conception of what is “at stake,” and there is an urgent need to update them to reflect more recent science and policy developments, including from the Intergovernmental Panel on Climate Change (20) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (21), the Paris Agreement for climate change, and the Convention on Biological Diversity.

The second potential model for a new convention is the Ruggie framework for human rights, because it has created a way to articulate the relationship between states and TNCs around an issue on which there is universal agreement. Similarly, there is clear intergovernmental consensus on the urgency of addressing climate change and biodiversity loss. A convention in support of corporate biosphere stewardship (7) could therefore acknowledge that states have a duty to protect ecosystems and that corporations have a responsibility to respect ecological functionality, regardless of whether states have effectively implemented regulations to protect ecosystems. The convention could also establish a framework for effective remedy when corporate action breaches ecological boundaries.

A convention that combines the OECD and the Ruggie approaches would be consistent with other aspects identified in this review, including the expectations of what constitutes good stewardship identified by many VEPs. How such a process could be promulgated, however, remains an open question.

8. CONCLUSION

The Great Acceleration into the Anthropocene biosphere (28, 38) has improved the health and material conditions for a large number of humans (157). But inequality is now challenging the performance of economies as well as the scope for collaboration and collective action (24, 84, 85). Shifts toward sustainable futures of both people and planet are critically dependent on corporations. TNCs provide benefits but have earned a poor reputation, often for legitimate reasons. Governance of TNCs has had limited success, and the global context for corporations is shifting. Transformations are the result of a combination of innovations, regime change, legislation, technologies, and more. Current political tensions and polarization, which in turn are stimulated by companies that dominate information technologies (92), risk resulting in radical change (137, 158).

The rationale for corporate biosphere stewardship (7) is increasingly evident: Natural resources of critical relevance for their operations are deteriorating, public trust is increasingly difficult to maintain, and multiple forms of pressure are creating incentives for TNCs to become responsible citizens in a global society. The conditions that first gave rise to TNCs have largely passed, and it remains to be seen whether they will persist in this changed context. Will governments maintain a role as passive observers, or is there sufficient political will to establish formal collaborative agreements between governments and corporations that are in line with the scientific understanding of the Anthropocene and actions toward sustainable futures?

SUMMARY POINTS

1. Corporations produce a range of externalities that negatively impact the planet, its ecosystems, and people.
2. International governance of environmental effects of corporations is rarely put in place proactively; instead, it is developed years after environmental problems have become evident.
3. A large diversity of voluntary environmental programs has been initiated—both by individual corporations and at the sector level—and is often inspired by nongovernmental organizations.
4. The combined effect of state-led and voluntary governance of corporations has been insufficient to meet the United Nations Sustainable Development Goals (SDGs).
5. Corporations are able to exercise substantial leadership by working alone, together in their sector with peers, or in cooperation with science.
6. A global convention that governs corporations is likely necessary if the SDGs are to be met in time.

FUTURE ISSUES

1. Are we heading toward an altered economic system, or will the current system be sufficient if there is an acceleration of alternate production systems?
2. Will the coming decade result in increased inequalities or the development of innovative financial redistribution mechanisms?
3. Will there be a substantial increase in local and small-scale solutions to address case-specific problems, or will novel technologies and innovations stimulate a radical change in how corporations interact with the biosphere?
4. Will transnational corporations continue to erode planetary resources or become net-positive for the planet and people?
5. Will there even be transnational corporations in a decade or two, or will history have moved on by then?

DISCLOSURE STATEMENT

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AUTHOR CONTRIBUTIONS

The author team constitutes a business–science “hybrid” that also spans academia, policy, and practice knowledge domains. As the review emerged, it was apparent that it would have been impossible for any subset of us to have written it (beyond the usual appreciation of coauthors and the synergistic nature of joint work). All coauthors are committed to and experienced in working in a sustainability science mode, which meant that we recognized that transnational corporation (TNC) accountability (and stewardship) was a topic of significance. Understanding the dynamics that underpin the Anthropocene biosphere requires in-depth science understanding of particular aspects of the system and, critically, how the whole system is manifest (H.Ö., R.B., and C.F.). At the same time, knowing why TNCs exist, their history, and the TNC governance gap is central knowledge for business scholars (J.B. and M.S.). We all understand possibilities for corporate biosphere stewardship from our experience of working on the Seafood Business for Ocean Stewardship (SeaBOS) and drew extensively on scholarship that has supported us in the science of SeaBOS. In this way, the sum of the review’s parts is greater than the whole, as well as being a valuable intellectual and joyous project.

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