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Extractive industries: transforming companies for better development outcomes

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Abstract: Companies in the oil, gas, and mining sectors face ever intensifying scrutiny over their environmental, social, and governance (ESG) practices and impacts: from civil society but also from investment funds and other stakeholders with ESG mandates. Companies with good practices—and the paper documents significant progress since 2000—can deliver substantial benefits to host economies: both local and national. The paper suggests further ways in which they could enhance their impacts in partnerships with government. Unfortunately, there are also companies that are at best cynical about their ESG impacts, or uncaring: the worst outcomes arise when they coexist with exclusive governments favouring elite interests. The paper also discusses the issues arising for companies from the eventual stranding of fossil fuels: international companies may exit oil and coal, and shift to renewables, at a much faster rate than national oil companies. The latter pose a potential macroeconomic risk.

Key words: Africa, extractive industries, mining, natural gas, oil

JEL classification: L71, L72, M21, Q35

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1 Introduction

The role of companies in the extractive industries is multi-facetted. Companies bring together the skills in finance, marketing, and technology necessary to develop resources that until extracted are otherwise valueless. A multitude of companies run the value chains. They locate and assess deposits; provide or borrow the necessary finance; build the necessary plant and other infrastructure; extract the oil, gas or ore and then process and transport it to refineries and finally market, sell, and transport the output in expectation of a profit. All this must be done safely without environmental and social damage and then, at the end of the project's life cycle, sites must be cleaned up and subsequently monitored for pollution risk. These are complex and demanding processes, involving many types of companies each with their own special skills, that must be sustained over timeframes often spanning many decades and involving significant risks—a great deal can go wrong.

Additionally, companies are now expected to make a bigger contribution to both the development agenda of host countries (especially at local level) and the climate agenda, both national and global. Some companies have made large strides, but others lag. This paper assesses some aspects of this agenda, and links it the newer corporate approaches of recent times.

We begin by briefly mapping the industry's landscape. Some 25,000 companies are engaged in the global mining industry and there are several thousands more companies in the oil and gas industry.[1] They differ by nationality, size, ownership, function and strategy, and the reader needs to keep this in mind as our discussion turns to how companies (ranging from 'good' to 'ugly') interact with governments (whose development performance ranges from 'effective and inclusive' to 'ineffective and exclusive'). The paper then turns to how corporate approaches have recently evolved, which sets the scene for some ideas about how companies might integrate better with host economies to deliver greater benefits for local communities and national economies. The paper concludes with how companies might evolve further, including in the context of the net zero and environmental challenges.

2 The extractives industries

Mining, oil, and gas are the epitome of global industries. Although the national origin of companies is one obvious differentiating factor, many multinationals are listed on several exchanges, and operate subsidiaries or branches in multiple national jurisdictions. A second differentiator is ownership. There are some huge national oil companies (NOCs): the value of the biggest, the partly privatized Saudi Aramco, exceeds those of international oil companies (IOCs) such as Exxon Mobil, Shell and Total. Other NOCs include China's National Petroleum Corporation (China's largest oil company) as well as Angola's Sonangol, Brazil's Petrobas, and Malaysia's Petronas.[2] In mining, state companies (wholly or majority state-owned) were common by the early 1980s—following a wave of nationalizations after independence—when they accounted for almost 50 per cent of global mine production and prior to the privatization wave of the 1990s which

1 Hodge et al. (2022: 1).

2 Sociedade Nacional de Combustíveis de Angola, E.P. (Sonangol); Petróleo Brasileiro S.A. (Petrobas); Petroliam Nasional Berhad (Petronas).

reduced their share to around 27 per cent today.[3] Botswana's Debswana, Bolivia's COMIBOL, Chile's CODELCO, and Zimbabwe's ZMDC remain partly or wholly state-owned.[4] Non-Chinese state-owned enterprises (SOEs) account for a relatively stable 10 per cent share of total world mining production.[5]

The giant western IOCs and the big listed western mining companies, notably Anglo American, Glencore and Rio Tinto, face increasing competition from the newer Chinese players. China Shenhua Energy (the third largest mining company in the world), and Jiangxi Copper (China's largest copper producer) grew rapidly after 2000 along with China's consumption of metals. China's Ganfeng Lithium and Tianqi Lithium are increasingly dominant miners and processors of this key battery metal. Russia for its part boasts Gazprom (one of the world's largest oil companies), Rosneft (another top-ten global oil producer) and Norilsk Nickel (the world's biggest producer of palladium and nickel). These companies morphed out of the old SOEs. Other large companies from the emerging economies include Brazil's Vale S.A., formerly state-owned but now private, as well as India's Vedanta Resources and Hindalco Industries: all have extensive international footprints.

The privately-owned commodity trading houses include Gunvor, Trafigura, Mercuria Energy, and Vitol. Glencore listed in 2011 and expanded into mining—becoming the world's largest mining multinational and one of the world's most valuable companies.

The giants of the industry, with assets running into the billions, inevitably dominate the headlines, but there is a myriad of more specialized companies as well.[6] The medium-sized companies are sometimes owned by multinationals but will typically focus on smaller deposits in one country or region, and on a narrow group of minerals. 'Juniors', which lead a high-risk life, typically sell their interests to larger companies with deeper pockets once discoveries are made ('farm-outs'). Below these is an ecosystem of contract miners; maintenance/technical support companies; financial service providers, consultancies in business administration, law, geology, engineering, and marketing; energy providers; construction companies; and equipment suppliers. Finally, artisanal mining provides a full time or part time livelihood for millions of people who interact, for good or bad, with large numbers of informal metals buyers and small trading companies, often Chinese in origin. Artisanal miners frequently operate in proximity to large commercial miners, which is another source of company-community tension.[7]

3 The Good, the Bad, and the Ugly

'Good', 'bad' and 'ugly' companies lie along a spectrum involving many different shades of performance. Here we use the three terms only in a relative sense. Good companies integrate

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[3] Hodge et al. (2022).

[4] *Corporación Minera de Bolivia* (COMIBOL); *Corporación Nacional del Cobre de Chile* (CODELCO); and Zimbabwe Mining Development Corporation (ZMDC).

[5] Ericsson et al. (2020).

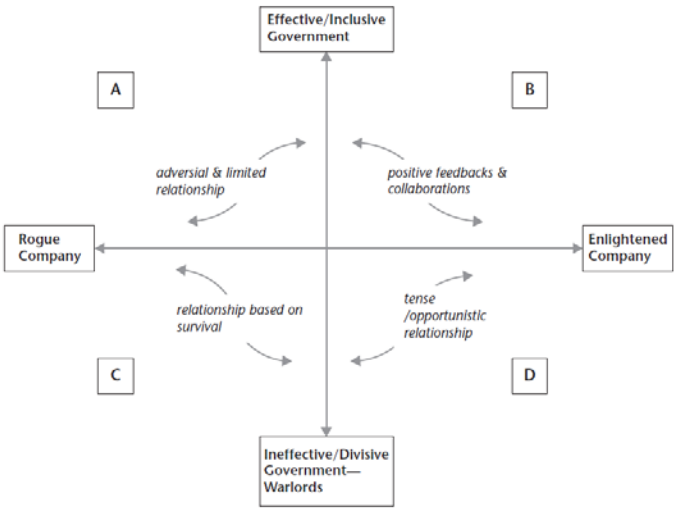
[6] Hodge et al. (2022) categorize mining companies as follows: 50 global giants (0.2% of all mining companies); 250 seniors (1%); 3,200 intermediates (13%); 10,500 production juniors (42%); 8,500 exploration juniors (34%); and 2,500 investment juniors (10%).

[7] Artisanal mining is a large topic and one that we cannot do justice to in this study; see instead O'Faircheallaigh (2023).

environmental and social goals into the core of their operations, taking their 'social licence to operate' seriously, while for bad companies this is mostly about public relations: they do the minimum and bend the rules whenever possible (including 'greenwashing'). Downright ugly companies disregard their environmental and social responsibilities, engage in outright corruption and can resort to violence (merging, at the extreme, into organized crime and warlordism).

Our earlier work set out a simple taxonomy showing the range of possible interactions between states and companies.[8] The best developmental (and environmental) outcomes invariably require partnership between good companies (here labelled 'enlightened') and effective and inclusive host governments: denoted by Zone B in Figure 1.[9] By 'effective and inclusive', we mean a government capable of formulating and delivering a coherent development strategy—with a clear vision of how the extractives sectors fit in.[10] There is then a reasonable chance that mining and oil and gas can be used to improve everyone's living standard not just that of the elites. Companies and the state will still engage in hard bargaining, but the rule of law will prevail—encouraging more investment and good corporate behaviour.

Figure 1: Four alternative interactions: companies and governments



Source: Figure 1.2 in Addison and Roe (2018: 16); authors' illustration. Reproduced under Creative Commons licence CC BY-NC-SA 3.0 IGO.

By contrast an ineffective/divisive state lacks a clear development strategy, its implementation capacity is weak, and its public finances are usually managed badly. A good/enlightened company can still help local communities, but the benefits will likely fall well short of community expectations, as synergies between companies and public institutions will be weak (Zone D in Figure 1). Opportunities to jointly finance infrastructure and other development projects will then

[8] Addison and Roe (2018: 16).

[9] On the interdependency of companies and governments in determining outcomes, Hodge et al. (2022: 10) conclude that: 'A significant complicating factor in addressing change across the full global industry is that across governments, there is a vast variation in interest, capacity, and strategic approach to effectively manage change in pursuit of enhanced social and environmental performance for the common good'.

[10] Hickey et al. (2015) discuss the meaning and role of 'inclusion' in development. The nature of the 'political settlement' determines in large part whether a country's development is inclusive; see Bebbington et al. (2018).

be missed, and communities often vent their frustrations on companies even if the government is at fault.

When the state is *exclusive* in orientation—benefiting a narrow elite—based perhaps on ethnicity or a narrow group of supporters to the exclusion of the citizenry at large, then even the best efforts of companies can fail to achieve local development benefits and meet community expectations (Zone D). Exclusive governments also attract (or themselves create) ugly companies, to facilitate their illicit wealth accumulation: personal interests rather than national interests then determine who gets the license to operate. Ugly companies (labelled rogue in Figure 1) seek to achieve the greatest possible return irrespective of the resulting environmental and social damage, and in fragile states they are after quick profits before any more politically favoured competitor moves in. Exclusion and ineffectiveness characterize 'fragile states', that category of mainly low-income countries (LICs) with a high propensity to violent conflict.[11] Civil society and the independent media will be harassed when they report abuse, and pressure for better outcomes from external agencies such as the Extractives Industry Transparency Initiative (EITI) will struggle. Rogue companies combined with ineffective and exclusionary government is the worst scenario (Zone C in Figure 1).

In sum, extractives companies are heterogenous. Their ability to deliver beneficial outcomes depends not just on their own efforts but also on the motivations and capacities of host governments.

4 Evolving corporate approaches

The past three decades have seen the spread of international norms for better business practices Many companies have aligned their policies and practices to the UN's *Guiding Principles on Business and Human Rights* (approved in 2011) especially around community relations.[12] More broadly, the UN's Sustainable Development Goals (SDGs), launched in 2015, have visibly affected corporate attitudes. Investors with ESG (environment, social, and governance) mandates increasingly exert pressure on companies.[13] Even the most conservative of chief executives now find it hard to ignore the financial advantages of aligning with ESG criteria, including broadening the investor base and cheapening the cost of capital. Swarms of ESG analysts together with a multitude of advocacy organizations have turned a bright spotlight onto the social and environmental practices of the largest publicly traded companies (and some of the mid-tier companies as well). Today's social media world also makes it harder to hide malfeasance—at least in open societies.

The extractive industries are part of this broader progressive trend. One of the biggest sector-specific initiatives was the foundation of EITI in 2003.[14] EITI now has 69 supporting (larger)

[11] Social exclusion is a catalyst for conflict, see Addison (2009); Addison and Brück (2009); Addison and Murshed (2005); Stewart (2009).

[12] UN-OCHR (2011).

[13] See for instance the Transition Pathway Initiative (TPI) https://www.unpri.org/sustainability-issues/climate-change/the-transition-pathway-initiative-tpi and TPI (2021).

[14] On the numerous initiatives, see Cust (2018) Hodge (2018). Bell (2018) focuses on the environmental dimensions, and the relationship of these initiatives to corporate social and environmental responsibilities (CSER).

companies that are committed to the initiative's core principles of transparency and reporting, particularly the disclosure of taxes and other payments to governments.[15]

New standards from the International Finance Corporation (IFC), an arm of the World Bank, have also been highly influential on the extractives industry. Around the Millennium the World Bank was persuaded, as civil society pressure mounted, to take a hard look at its own performance. One outcome of its *Extractive Industries Review*, conducted over 2002/03, was the IFC's Performance Standards, introduced in 2006.[16] This was ground-breaking, not only in establishing a comprehensive set of environmental and social standards, but also in setting out tangible steps to guide companies in managing their environmental and social risks and impacts.[17] Today the IFC Standards arguably have had the most impact of all the international standards; they are widely referred to in company practice (and have indeed been adopted by many projects that are not IFC financed). They provided the model for the 'Equator Principles' applied by major financial institutions to their project financing and complement industry initiatives—notably those of the International Council on Mining and Metals (ICMM).[18] These initiatives also influenced the 2014 standard issued by China's industrial organization (CCCMC) which represents 6,000 companies: the vast majority of China's mineral industry operating abroad.[19]

Within mining, ICMM's creation in 2001 was a big step forward, and one led by the chief executives of large mining companies in response to intense criticism by non-governmental organizations (NGOs) as well as pressure for change from within the industry itself.[20] ICMM has since helped to improve the practices of its 28 company members, which are subject to stringent membership criteria, involving a rigorous admissions process followed by regular subsequent monitoring: every member company must adhere to 10 Principles and 8 Position Statements (which are regularly updated).[21] In 2019 ICMM was one of the leaders in responding to the Mariana tailings disaster in Brazil, resulting in the first international standard for the safe management of tailings storage facilities. In 2020 ICMM introduced its new Mining Principles which include improved ESG practices for its own members.[22] ICMM members are now expected to reduce water consumption (a big concern in water-deficient areas), end biodiversity loss, commit to net zero by 2050, and contribute to attainment of the SDGs.

Other corporate initiatives include The Copper Mark, created as an independent agency by the International Copper Association in 2019 with input from companies and NGOs, which aims to encourage responsible production practices and the green transition among copper miners.[23] Such industry initiatives are complemented by collective efforts in organisations such as the Responsible

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15 See: https://eiti.org/supporters/companies

16 World Bank (2003). IFC (2012). Addison and Roe (2018) discuss this further.

17https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards

18 See: https://equator-principles.com/about/

19 The China Chamber of Commerce of Metals and Minerals and Chemicals Importers and Exporters (CCCMC) (https://en.cccmc.org.cn/about/introduction.html). On China's companies, see Dolega and Schüler (2018).

20 See: https://www.icmm.com/en-gb/about-us/our-organisation/annual-reviews/our-history

21 ICMM's ten principles: https://www.icmm.com/en-gb/our-principles. Some of these have been adopted by mining companies that are not ICMM members, including Chinese companies.

22 These cover biodiversity, gender, human rights due diligence, labour rights, local content, mine closure (and the management of post-closure liabilities), pollution, resettlement and waste. Hodge and Brehaut (2022) discuss closure and post-closure issues.

23 See: https://coppermark.org.

Mining Foundation (RMF) and the Global Reporting Initiative (GRI). The first of these promotes the responsible sourcing of minerals along many of the world's most significant supply chains. RMF's periodic report, *The Responsible Mining Index* (RMI), based on field surveys of ESG practices in a large number of mine sites (253 in the 2022 report) across all continents, is an invaluable guide to the strengths, weaknesses and progress of companies.[24] GRI, established in 1997, maintains a set of standards for the reporting of company impacts in their host locations.[25]

In sum, at least part of the mining industry now has a more coherent approach to sustainable development. Companies now must deliver on it, and are more accountable if they fail.

The situation among the western IOCs points in a similar direction—albeit at a much slower pace than in mining and with less industry coordination. Although the oil industry has its own association, IPIECA (founded in 1974), its mandate is less ambitious than ICMM's and, unlike ICMM, it is not led by company chief executives.[26] For much of their history, the international oil and gas companies have taken the view that they should focus on their core commercial business, comply with local laws (while lobbying to reduce regulation), pay their taxes (while manoeuvring to minimize them), and provide some basic *ad hoc* benefits to local communities.[27]

This started to change in the late 1990s when BP and Royal Dutch Shell in particular shifted to a more rigorous approach, following allegations of company complicity in human rights abuses as well as environmental damage (revealed in investigations by Greenpeace, Human Rights Watch and Oxfam among others).[28] Encouraged by new chief executives and board chairs, BP and Shell introduced more robust internal corporate codes of conduct and established corporate functions dedicated to 'social performance' issues. More significantly, BP and Shell worked with the UK and US governments and various human rights NGOs to establish, in 2000, the *Voluntary Principles on Security and Human Rights* (VPs) one of today's key standards for the industry—31 major IOCs (and mining companies), including some of the biggest, are now signatories.[29] Regrettably, however, these companies do not include, with the exception of Norway's Equinor, many of the world's largest NOCs like Saudi Aramco, nor the Russian companies such as Gazprom and Rosneft.[30] These non-members produce around *half* the world's oil and gas. Nor does it include most of the less visible smaller companies. The oil and gas industry has made progress, but still has a long way to go.

In short, many IOCs as well as mining MNCs are now more alert to the need to manage their reputational risk in the face of increased media attention and civil society's ability to investigate and publicize malfeasance. Voluntary standards provide a means for civil society and governments to hold responsible companies to account. And the composition of the corporate workforce also

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[24] RMI (2022). See also RMI (2018, 2019).

[25] https://www.globalreporting.org

[26] International Petroleum Industry Environmental Conservation Association (IPIECA). See: https://www.ipieca.org

[27] Tomlinson (2018) provides a substantial review of the evolution of oil and gas companies on social and environmental issues.

[28] BP was alleged to have been complicit in human rights abuses in the late 1990s in Colombia and Sudan (which it denied). Shell experienced serious reputational damage from the execution in 1995 of Ken Saro-Wira and nine other environmental activists by the then Nigerian military dictatorship (see Doron and Falola (2016). Human Rights Watch (https://www.hrw.org) has undertaken in-depth investigations of these cases. Oxfam has investigated corporate practices in relation to communities (Slack 2018).

[29] See: https://www.voluntaryprinciples.org

[30] https://www.voluntaryprinciples.org/the-initiative/

pushes in the same direction. More younger managers and engineers want careers that benefit society and the environment, and the industry is now keen to attract more female talent. The responsible portion of the industry recognises that reputational damage harms recruitment and the bottom line. The *RMI 2022 Report* notes that formal ESG commitments are becoming the norm amongst the companies surveyed—with evidence of some very good practice.[31]

However, the *2022 RMI Report* also finds significant gaps remaining in most companies as between: (i) commitments and actions and then; (ii) actions and effectiveness. The *2022 RMI Report* has uncovered systematically weak results in areas such as the disclosure of financial surety arrangements for both closure-related liabilities, and the financial assurances needed for disaster management and recovery.[32]

Disasters can therefore still happen. In addition to Vale Ida's negligence leading to the Minhas Gerais tailings disaster in Brazil in 2015, Rio Tinto destroyed a 46,000-year-old Aboriginal heritage site in Western Australia in 2020, and also in 2020 a spill from a Norlisk Norsk Nickel storage facility in Russia caused massive environmental damage to a Siberian River. These are just three examples—we could cite more.

There is no single answer to why these disasters and broader failures in ESG areas still occur, but explanations range from: compliance controls that degenerate into box-ticking; the often long distances between field operations and company headquarters; the low status within companies of field staff undertaking community and environmental assessment; and periodic cost-cutting that impacts disproportionally on environmental and social work streams.[33] Regulatory oversight by local and national governments certainly needs to be tightened, and punishments must go beyond chief executives simply losing their well-paid jobs.

5 Delivering greater development impact

By development impact we mean the achievement of higher living standards—especially for poorer citizens—while at the same time protecting nature (via action on pollution, deforestation and harmful emissions). Here we discuss the role of companies—and argue for greater *ambition*.

5.1 Addressing community needs

Community impact is a hot topic, with a proliferation of media reports, NGO and community-organized activism, and some high-profile court cases.[34] Responsible companies recognize that

[31] RMI (2022).

[32] Hodge et al. (2022) and Hodge and Brehaut (2022) note that only in the late 1990s did issues of closure and management of post-closure liabilities begin to find their way into corporate and government decision-making in the mining industry: they still remain deficient in many cases.

[33] Hodge et al. (2022) link such shortcomings to the corporate culture in mining which is a source of inertia and resists change.

[34] Organizations representing communities have brought cases against companies to European courts. For example, in 2021 a Dutch court ordered Shell to pay compensation for oil spills to two villages in the Niger Delta region. Ecuador is an especially interesting case of indigenous peoples and the 'right to nature'—enshrined in Ecuador's constitution; see Eisenstadt and Jones West (2019).

delivering more benefit is a tangible way to build trust with host countries and diffuse any tensions that otherwise might threaten their social license to operate.

Guidance for companies is now abundant.[35] ICMM's *Community Development Toolkit* (CDT) has five sets of tools for good practice in community relations: relationship building; management; planning; assessment; and monitoring/evaluation.[36] To be effective, any corporate approach must have explicit requirements to: respect human rights and local customs; adequately compensate resettled populations; ensure emergency response arrangements; provide health and safety monitoring and training; assess and mitigate environmental damage and risk; and consult with local communities to support their development aspirations.

One comprehensive model is Anglo American's *Socio-Economic Assessment Toolbox* (SEAT) which has detailed guidance for collecting and analysing community information.[37] SEAT has many practical suggestions on how to work with communities, including: resettlement (in South Africa); security and human rights (Colombia); leveraging funds (the Anglo American Khula Mining Fund in South Africa); enhancing local skills (Brazil); revenue transparency (Colombia); basic infrastructure provision (water in South Africa); and health and HIV/AIDS (South Africa).

Health is another promising area for company impact. Government can work with the companies to ensure that their CSER projects (especially on education and health) are well aligned—even synergistic—with the governments' own programmes. Ghana provides an example of a company, AngloGold Ashanti, successfully creating a robust malaria programme well-aligned with national efforts, and indeed one that helped catalyse a bigger donor-supported nation-wide effort (see Box 1).[38]

Yet for the extractives industries generally, communities are all too frequently disappointed, especially over jobs, pollution, and displacement by mining infrastructure.[39] An evidence base of impacts, often harmful, has accumulated. The authoritative *2021 Resource Governance Index* report by the Natural Resource Governance Institute (NRGI) states, for example, that: 'Local impacts of the extraction of oil, gas and minerals have long been a major area of contention between companies, affected populations and governments. On average, all practice and disclosure-related indicators in the index's local impact subcomponent demonstrated poor or failing levels of governance' (NRGI 2021: 14).

Complaints about companies in this area have three main themes: (i) gaps between statements of intent, often impressively presented in glossy publications and web sites, and actual delivered outcomes; (ii) the lack of any legal force behind many of the voluntary obligations that companies make (Brazil being an important exception); and (iii) the absence of independent and rigorous monitoring and evaluation of performance, and an over-reliance on company self-reporting.

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[35] The earliest was ILO's *Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy* in 1977, but successively amended, most recently in 2022 (https://www.ilo.org/empent/areas/mne-declaration/lang--en/index.htm). Africa Mining Vision has a rather broader focus (www.africaminingvision.org).

[36] ICMM (2012). Catherine Macdonald, a principal author of the toolkit, discusses its evolution in Macdonald (2018a). See also Filgueiras et al. (2018) on approaches applied by Vale SA.

[37] Anglo American (2014).

[38] On other initiatives see ICMM (2010).

[39] Tomlinson (2018).

What goes wrong? First, as we noted earlier, corporate culture is often the root of failure. The problems can begin right at the start of the mining or oil and gas investment. Social impact assessments (SIAs) are now used by most IOCs and mining companies but will degenerate into box-ticking if top management is not fully committed.[40]

Box 1: Ghana: AngloGold Ashanti and malaria control

Ghana suffers one of the world's worst health burdens from malaria. In the locality of the Obuasi mine run by AngloGold Ashanti (AGA) malaria accounted for nearly half of all cases at health facilities as well as 22% of all deaths by the early 2000s.[41] AGA estimated that malaria among its employees was causing the loss of working time equivalent to nearly one-third of its 8,000-strong workforce.

The response was an effective partnership between AGA, the health ministry, and local communities to deliver a programme of prevention and treatment—known as the 'Obuasi model'—that was initiated in 2006.[42] The programme led to a 75% drop in malaria cases in the Obuasi mine area in eight years, well above the 50% target set at the programme's inception, benefitting pregnant women and young children especially (with school attendance among older children improving as well).[43] AGA has also benefited: by 2012 its monthly spending on malaria treatments was only US$510 compared to US$55,500 previously.

AGA has invested approximately US$1.5 million annually in the programme. The impact was such that the programme eventually attracted funding of US$138 million from the Global Fund to Fight Aids, Tuberculosis and Malaria which enabled a substantial scaling up as well as expansion, led and managed by the Global Fund, to 40 districts in Ghana including those where malaria's incidence is even worse than in Obuasi.

The Obuasi model was a significant component of what has proven to be a large-scale national anti-malaria programme. Ghana has gone on to greater success, and malaria vaccination across Ghana from 2019 onwards has cut the prevalence of the malaria parasite in children under-5, including in Obuasi.[44]

Second, companies may have CSERs but if the specifics are not clear with government (local and national) and communities (i.e., a tripartite approach) then confusion and continuous bargaining results. Trouble often starts when government sees CSER as a substitute for meeting its own responsibilities.

Third, if local governments with weak capacities do not share in the increased revenues from a project, then they are less able and likely to deliver on their responsibilities. Corporate action works best with good-quality local government (and mandated community development agreements (CDAs) in some cases: see Box 2).

Finally, civil society organizations (CSOs) and NGOs can act as trusted brokers between the three parties. But this should not be assumed. These organizations are heterogenous, and their different mandates do not necessarily fit well with what the three parties are trying to achieve. Some are

40 On SIA see Becker and Vanclay (2003) and the International Association for Impact Assessment https://www.iaia.org.

41 AfDB (2016: 9).

42 https://bhr-navigator.unglobalcompact.org/case_studies/private-public-partnership-to-address-malaria-in-the-workforce-and/

43 AfDB (2016: 11).

44 https://www.afro.who.int/countries/ghana/news/malaria-vaccine-plays-critical-role-turning-tide-malaria-ghana

service providers while others concentrate narrowly on advocacy, and many have expertise in only a single area (e.g. the environment or human rights).[45]

Box 2: Legislating for community development

Should countries move to a *mandatory* approach to community development, instead of relying on voluntary action by companies, not all of whom are good corporate citizens?

Legislation that governs company-community relations avoids treating companies individually on an ad hoc basis which can result in inconsistent practices (and lobbying to reduce responsibilities). Compared to a voluntary approach, the responsibilities of all parties in a mandated approach should be clearer (reinforcing the tripartite approach), and companies will know the minimum level of development funding expected of them. Formal consultation, grievance and dispute resolution approaches can also be established, giving communities (hopefully) greater certainty about benefits.

Building institutional capacity is essential for a mandatory approach to work. Otherwise, a large administrative burden will be added to often over-stretched regulatory agencies.[46] Donors should support capacity-building with funding and technical assistance.

At least 43 countries have mining legislation requiring CDAs.[47] Many of these are linked to a World Bank initiative to create model CDA regulations and guidelines.[48] The widespread use of CDA legislation is a relatively new phenomenon and so its efficacy is still open to debate. However, if the CDA legislation is robust—as in the model legislation—it can provide a roadmap for mandatory approvals, monitoring, and enforcement, all of which voluntary approaches can lack.[49] Moreover, hybrid approaches combining mandated elements and voluntary activities can also work quite well, as Brazil demonstrates.

Zambia illustrates all these difficulties but also some promising initiatives. Mining communities are frustrated about livelihoods, pollution, housing, and health care.[50] Companies maintain that they meet their responsibilities. The government's regulatory powers are weak—relying on self-reporting by companies—and independent verification is limited. Fundamentally, the respective responsibilities of the government and the companies are unclear. Prior to privatization in the 1990s, the dominant state mining company Zambia Consolidated Copper Mines (ZCCM) provided a wide range of services including healthcare. This social model collapsed along with copper prices in the 1980s leaving a gap in local provisions. After privatization the state was expected to take over these functions, funding them via the higher tax revenues from a reinvigorated mining industry. In the event delivery along those lines has been bedeviled by generally weak public services and fierce tax disputes.[51] A Zambian analyst of long-standing experience, Angel Mondoloka, writes that the resulting gap between community expectations and companies' delivery is '… worsened by the government's continuing failure to undertake the

[45] Slack (2018) examines the political dynamics around CSOs and NGOs in relation to the extractive industries. Bebbington et al. (2008) discuss the development role and effectiveness of NGOs.

[46] Aubynn (2018).

[47] Otto (2018). Note that not all of these comply fully with the standard CDA definition.

[48] World Bank (2012). The framework addresses various challenges to implementation such as: who should be a party to a legislated agreement; how might the negotiating capacity of a local community be enhanced; and which types of operations are amenable to coverage using a CDA?

[49] Otto (2018).

[50] NGOs have assisted Zambian communities to pursue a number of class-action lawsuits against mining companies in recent years.

51 Lundstøl and Isaksen (2018); Manley (2017); Mwaba and Kayizzi-Mugerwa (2021).

necessary development projects and deliver corresponding social services in mining communities'.[52]

Despite these problems, there are now several Zambian examples of community-driven approaches to catalyse dialogue and partnership between mines, local authorities, CSOs, and traditional community leaders. Efforts are underway to strengthen community organisations and build the capacity of CSOs to act as effective trusted brokers. One local NGO, for example has collaborated with EITI to develop its negotiating skills to achieve an increased commitment by the municipal council, out of its mining tax revenues, for communities that have suffered from environmental damage, livelihood disruption, and displacement due to mining activities.[53]

A final point is that the increased collection of information on living standards, both quantitative and qualitative, to monitor and evaluate progress against SDG benchmarks now offers companies a much improved opportunity to rigorously understand the *impact* of their own investments, especially the multiplier effects resulting from increased economic activity, and their impact on poverty metrics (e.g. through the use of panel data).[54] There is also now an extensive literature on impact evaluation that uses various different techniques to understand the effects of policy and projects on households (including the gender dimensions: SDG 5).[55]

5.2 Maximining national development impact

Responsible companies now recognise their obligations to localities and communities. The situation is more ambiguous at the national level. Certainly, responsible companies will comply with their legal tax obligations. But do they see any national role much beyond that?

We argue that companies can contribute significantly more to national development goals. Figure 2 shows a sample of four intersections between corporate and government functions, where collaboration could be mutually beneficial, and which we discuss briefly here. In addition to these, companies can play a much bigger role in helping their host countries meet their nationally determined contributions (NDCs) under the UN Paris Climate Agreement, as well as other environmental goals, as discussed later.

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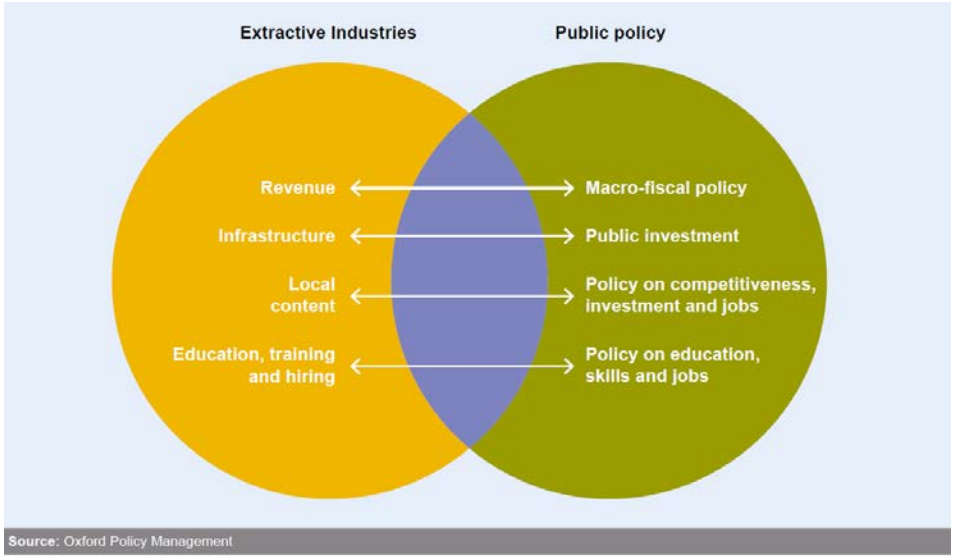
[52] Mondoloka (2018: 621).

[53] See Mondoloka (2018) for a detailed analysis of these projects including the significant Lumwana Community Development Forum (LCDF).

[54] Qualitative information is as important as quantitative information, because this can capture perceptions around impacts that household surveys of, say income and expenditure do not. Addison, Hulme, and Kanbur (2009) discuss 'Qual-Quant' approaches to poverty dynamics.

[55] Cochrane (2017) provides an example of the use of anthropology in understanding the impact of mining projects. MacDonald (2018b) discusses the gender dimension of the extractive industries.

Figure 2: The intersection of shared interest between companies and government policy



Source: Dietsche et al. (2013: figure 5); reproduced here with permission.

Revenue. While companies are keen to minimize their tax bills—and the worst will evade their legal tax obligations—many are large contributors to the exchequer (indeed, sometimes the very largest). Therefore, in principle they have an interest in the effective management of both public revenues and the resulting public spending. Weaknesses in the latter exacerbate company-community relations as discussed earlier. Additionally, weak management of the public finances ultimately leads to macroeconomic distress which is a risk to company operations and profitability (ranging from production shutdowns to governments seeking a higher tax take or, *in extremis*, nationalizing the company). Although companies obviously have no mandate to engage directly with fiscal policy, their technical input could be helpful, not least in helping government economists avoid outcomes such as the resource curse. For example, a frank and regular sharing of price and longer-term production forecasts should help national treasuries improve their fiscal forecasts and projections for debt-servicing.

Infrastructure. Companies make large investments in roads, rail, water, power and even ports, which offer opportunities to boost the local non-resource economy, especially in ill-served remote and poorer localities. Such investments can complement publicly financed infrastructure, or even extend their access at low marginal cost to provide both local and national benefits e.g., feeder roads from main roads for rural communities to reduce marketing costs and improve food security.[56] For this to work governments, both national and regional, need a good strategy to leverage private investment and coordinate it with public investment. This should be driven by a well-articulated national development plan. Consulting with companies in its preparation, including the various links to the energy transition and the net zero agenda more generally, would be helpful in identifying opportunities for private-public partnership.

Local content. This is commonly presented as an obligation imposed on companies rather than as an opportunity for active cooperation. Experience tells us that local content policies work best when company programmes to provide finance, training, and mentoring are coordinated actively with government programmes. Companies can also help governments identify constraints on enterprise development, especially for small and medium-sized enterprises (SMEs). The Anglo

[56] One example is the road programmes of Tenke Fungurume Mining in Katanga, DRC (OPM 2013).

Zimele (AZ) programme run by Anglo American in South Africa is an example of SME support via financing and advisory services. Another is Brazil's Vale S.A. which links its supplier's development programmes with those of government, local chambers of commerce and others.

Education, training and hiring. All companies need significant and qualified labour forces, and skill requirements continue to grow as mines and oil and gas facilities automate even further. Public-private partnerships to build training programmes, and to align these with wider national and local policies on education, skills development, and employment-generation, should be beneficial, especially when the skills are transferable to other sectors (especially in information technology and financial management).[57]

These four examples of possible collaboration fit quite comfortably with established company practices. And there are many other ways to construct cooperative partnerships including increasing opportunities linked to climate targets.[58] Many companies have already incorporated at least some of the SDGs into their own operations. Significantly, SDG 17 refers to partnerships for sustainable development.[59]

Companies today should recognise that they are more than marginal players in many LICs and MICs, and that the scale of their *macroeconomic* impact is invariably significant. This being the case companies have an obligation to develop a clear understanding of where their own activities fit into the broader macroeconomic framework of a country and its ambitions for economic transformation and poverty reduction. Companies disinterested in such national matters forego an important opportunity to enhance both longer term profits and image. In a *lacuna* situation where host governments also fail to see the full scope of the possible corporate impacts, both actors will miss important opportunities for synergies. The ideal situation is one where companies with a broad understanding of their own societal impacts collaborate with inclusive governments that have a holistic vision of the long-term benefits of extractive industries—benefits not just confined to the revenue stream. This type of shared mindset can be a rich breeding ground for many positive initiatives. The regrettably more common situation is one where national governments and companies meet only infrequently and then only to argue about taxation.

6 The climate dimensions of corporate action

6.1 Mining

For mining companies, the growth in the material requirements of the net zero economy is a growing market driver but one that will require them to ride the new vicissitudes of global markets. While this trend is mostly their friend, mining companies face uncertainty over the source of critical minerals and are now investing more in countries they previously avoided. This is good news for poorer countries, not only in boosting their revenues but in building infrastructure that could have broader economy-wide benefits. New and closer relationships are also evolving between

[57] The African Mineral Skills Initiative (AMSI) is one innovative approach.

[58] ICMM (2011) provides a partnerships toolkit which has been applied in at least ten country case studies (including Ghana, Peru, Tanzania, Lao PDR, Zambia and Brazil) with governments and companies working closely together to establish a sound basis of facts and ideas about actual and possible new partnerships and synergies.

[59] WEF (2016) provides a guide for mining companies to map their activities to the SDGs (from exploration, through operations to mine closure). Analysis and advice is available from the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) (https://www.igfmining.org) as well. See also McPhail (2018).

manufacturers of electric vehicles (EVs), refiners and mining companies to secure future supplies, including cross-investments, off-take deals and, most ambitiously, the outright purchase of mining companies to achieve vertical integration.[60] More controversial is the expansion of seabed mining, with its uncertain environmental impacts.[61]

Some miners—mostly publicly-traded western companies—are positioning to attract ESG investors by measuring and cutting their scope one and two emissions, making plans to cut their scope three emissions, and aligning themselves with the guidelines of the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (TCFD).[62] Chief executives increasingly like the resulting upside for the company's share price (and their own renumeration) and chief financial officers like the cheaper cost of capital. Mining companies which moved early to reduce emissions have market valuations some 20 per cent higher on average than their tardier peers.[63] Some mining companies are also successfully placing 'green bonds' and 'transition bonds' (a new class of financing for companies that offer investors a convincing plan to go green). ICMM member companies now publicly support carbon pricing.

Mines are huge consumers of power: sometimes a country's biggest. Shifting to renewable energy not only reduces their emissions but also shows leadership by demonstrating to companies in other sectors what is possible.[64] Chile has taken a lead in green mining, boosted by a national strategy to use more of its wind and solar resources: all of Antofagasta's copper production is now run on renewable energy.[65] Anglo American has now achieved 100 per cent renewables for all its power requirements in Brazil, Chile and Peru.[66] Gold Fields has made substantial financial savings by increasing the share of renewable energy in its operations in Chile, Ghana, Peru and South Africa have.[67] Greater use of hydro power is also a possibility for some mining, and hydrogen use is also set to grow, especially in transport. In short mining companies with their huge investments, can be a source of significant change in relation to a host country's energy transition.

Nevertheless, despite this progress, mining companies have not transitioned to clean energy at the speed nor on the scale needed.[68] Progress has been held back by the intermittency of supply if wind or solar is used on site (and if hydro is not available): mines have huge power requirements and grid supplies are often from coal-fired power. Ill-advised regulation also holds companies back. In South Africa, mining companies—the country's biggest buyers of electricity—were, until 2020, blocked from generating their own electricity. This protected their biggest power supplier, Eskom, the unreliable and heavily indebted state utility which needed a captive market, and coal dominates Eskom's generation capacity.[69]

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[60] UNCTAD (2023). A prominent example is China's Ganfeng Lithium—a top global producer of the battery metal—with its acquisitions of lithium deposits in Australia, Argentina and Canada, among others.

61 Marine mining is the focus of the UNU-WIDER study by Löf et al. (2022).

62 https://www.fsb.org/. McKinsey Sustainability (2020) provides a guide for companies intent on decarbonization.

63 Bour et al. (2020: 3).

64 Alova (2018).

65 https://copperalliance.org/resource/antofagastas-copper-production-powered-by-100-percent-renewable-energy/

66 https://www.angloamerican.com/media/press-releases/2021/15-04-2021

67 Gold Fields (2023).

68 World Bank (2020).

69 Harvey (2018: 171–73).

Some 4–7 per cent of global emissions are generated by the operations of mining companies (and are therefore under their own direct control).[70] But once scope 3 emissions are factored in the share is a great deal higher because of the dominant effect of emissions from burning coal, and coal's continuing high share of energy (where the latter accounts for 75 per cent of global emissions).[71] Scope three emissions therefore remain a daunting challenge for miners (and refiners), as discussed in the next section. Some companies have committed to net zero, including scope 3 emissions. Many merely publish targets for this to apply only at some far distant date. One leader is Gold Fields.[72] Others are largely silent on the issue.

6.2 The coal dilemma

Coal accounts for roughly three-fifths of the fuel mix in global electricity generation.[73] Coal-fired plants are still being built, with the developing world accounting for around 90 per cent of those expected over the coming years, notably in China, India, and Indonesia where coal still accounts for around 60 per cent of electricity generation (even as renewables increase their shares). In much of the developing world coal is still seen as the cheapest and easiest route to ending energy poverty, despite accounting for one fifth of global emissions (the biggest single source).[74]

Shutting coal plants down in the developing world is a monumental task. Many are highly indebted, and their early closure poses a risk to domestic financial systems (especially in China), closure will cause job losses in both power generation and mining (a big concern in South Africa), and they supply much of the power to the new industries under development (paradoxically, including Indonesia's EV manufacturing). Moreover, whereas coal plants in the richer world are mostly near the end of their effective lives, those in the Global South, being much newer, can expect decades of life: Asia's new coal plants have a lifespan of 40–50 years.[75] Yet the continuation of coal in the energy systems of developing countries will be an increasing headwind for their successful participation in global value chains (GVCs) as these turn green. This risk might eventually catalyse a reversal of attitudes to coal in the Global South, but the coal industry remains profitable, it is politically influential (especially in India and Indonesia), and wealthy and powerful lobbies support it.[76] The industry is also a big employer, and local communities will also resist closures if they are offered few alternative sources of livelihood.

Coal is therefore far from dead, at least in the developing world—which is now the largest market. So, does this mean business as usual for coal mining and its companies? The answer is not yet clear. The financing of coal investments has become harder. Banks and financial institutions made landmark commitments at COP26 in 2021 to end the funding of coal: they included major

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70 https://www.globaldata.com/data-insights/mining/

71 Mitchell (2019). See also Evans (2020).

72 Gold Fields (2023: 16).

73 IEA (2023a: 11).

74 Birol and Malpass (2021). Coal combustion also releases such toxic pollutants as nitrogen oxides, sulphur dioxide, heavy metals, and particulate matter.

75 The average age of an existing coal power plant is 11 years south-east Asia, 13 years in both China and India, 34 years in Europe and 41 years in the United States. Source: https://www.iea.org/data-and-statistics/charts/average-age-of-existing-coal-power-plants-in-selected-regions-in-2020.

76 Newer coal plants deploy scrubbers and other technologies to reduce the emission of toxic pollutants, making them 'cleaner' than older power plants. This is encouraged by tighter regulation in India and China among others. Reducing the huge CO_2 emissions from coal plants poses much bigger technical and economic challenges, and carbon capture and storage (CCS) has had limited adoption to date. Achieving 100% carbon capture is very expensive and is unlikely to happen without a high carbon price.

international lenders like HSBC, and Fidelity.[77] Insuring coal mines (and coal-fired plants) is also more expensive.[78] Coal assets have weighed down the share prices of mining companies. Some western mining companies have disposed of their coal assets or are planning to do so, not least to focus their efforts on the critical minerals demanded by the net zero transition (and thereby making themselves more attractive to investors). Rio Tinto sold all its coal assets in 2018, and in 2021 Anglo American hived off its South African thermal coal into a separate listed company Thungela Resources.[79]

Yet Glencore, one of the world's biggest miners of thermal coal for export, which in 2020 committed to run down its coal assets (already in Colombia and next in South Africa), acquired more in 2023 when it bought a stake in the (coking) coal business of Canadian miner Teck Resources but with a plan to spin off the coal assets into a separate company. Glencore's ambition is still to become a pure play miner of metals, but the time-scale for this goal remains uncertain.[80]

More fundamentally when mining companies divest their coal assets the emissions do not disappear. Like pushing on one end of a balloon that shifts the air to another part, the emissions are merely transferred to another commercial entity—becoming the responsibility of the new company and its shareholders. That company may actually expand its coal mining operations (Thungela Resources subsequently intensified its search for new coal assets).

As the big western companies divest their coal assets, so the buyers of coal mines come increasingly from the developing world. Thus, the Indian conglomerate Adani Group now controls mines in many overseas locations including in Australia and Indonesia. And the new buyers may be privately owned in which case they are not subject to the same ESG pressures as publicly traded companies. Unless governments push for regulation and carbon pricing to encourage the switch from coal to cleaner power generation, then thermal coal mining will remain profitable. The market for metallurgical (coking) coal will also remain robust until new technologies of steel production are more widely adopted.

When the coal industry does begin to downsize, comprehensive public programmes to aid affected communities via retraining, investment promotion of new activities, and environmental clean-up are vital. Yet delivering a 'just transition' is far from straightforward and is certainly not cheap. This is another reason why governments may alternatively seek new companies to continue coal production—especially when it remains a major export earner as well as a key source of domestic energy generation.

6.3 Oil and gas: the sunset years

Global climate action including the increased take-up of renewable energy and EVs will eventually strand fossil fuels—but at rates differentiated by country. The timings are uncertain, but companies must now regularly update their strategies for this emerging future amidst rapid technological change. Oil and gas companies must decide how far to incorporate renewable energy, energy storage and carbon capture and sequestration, into their business portfolios.

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77 Loan spreads for coal mines rose by 54% over 2007–20 (Zhou et al. 2021).

78 Insurers are well aware of climate risks and in 2018 the industry leaders pledged to stop insuring or reinsuring projects that had significant thermal coal exposure.

79 https://www.thungela.com/. Anglo American has retained its coking coal assets.

80 'Digging Deep: will Glencore ever say goodbye to coal?', *The Sunday Times*, 3 December 2023.

They are already cutting their scope one and two emissions, encouraged by tighter regulations, carbon taxes and fines as well as intensifying pressure from investors and, especially, environmental campaigners. Companies are fixing fugitive emissions from corroded pipelines, reducing venting and flaring.[81] Methane has been a special area of concern. In 2021 more than 100 countries signed the Global Methane Pledge at COP26, a collective commitment to cut global methane emissions by at least 30 per cent by 2030.[82]

This is a promising start but some 80–95 per cent of the emissions of the global oil and gas industry are categorized as scope three and, according to industry watcher Wood Mackenzie, only 10 large companies have committed to net zero scope three, most with a target date well into the future (commonly 2050).[83] The reason for this tardiness is not hard to see: achieving net zero emissions requires a fundamental recasting of business models. Only one big oil and gas company has shifted entirely into renewable energy: Denmark's DONG Energy (now Ørsted). [84] Much of the IOCs strategy for net zero consists of continuing to extract oil and gas while engaging in carbon offsetting and CCS (the latter with an eye on using old and empty oil and gas wells to sell CCS to high emitters such as steel and concrete producers).[85] Most of the IOCs now have portfolios of renewable assets, with TotalEnergies being the most ambitious. But BP and Shell have flip flopped over their commitment to renewables and have shifted back to prioritising increased dividends and share buybacks.[86] The industry's investment in low-emissions energy sources averages less than 5 per cent of its upstream, according to the IEA.

The biggest IOCs control around 14 per cent of global gas reserves and 12 per cent of global oil reserves.[87] The IOCs operate right across the developing world, and how they position themselves on the energy transition impacts especially on the newer producers such as Guyana and Mozambique—where they are the sector's principal investors—as well as in sub-Saharan Africa more generally. During the pandemic, when oil prices collapsed, they pulled back on new investments in older and high-cost fields such as those in Angola but reengaged after 2021 as the West sought to replace Russian oil and gas.

However, while the biggest IOCs command most media attention, it is the NOCs which control the bulk of global oil and gas assets, over US$3 trillion. Their businesses focus mostly on assets in their home countries (though some, notably Malaysia's Petronas, have grown their overseas operations).[88] The NOCs vary considerably in their scale and technical capacities (see Box 3). They

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81 Emissions from global upstream oil and gas consist of 2/3 carbon dioxide and 1/3 methane (a more potent greenhouse gas).

82 www.globalmethanepledge.org

83 Wood Mackenzie (2022).

84 https://orsted.com/

85 Norway is a CCS pioneer, encouraged by licensing requirements and emissions taxes. CCS has not progressed much in the developing world beyond a few projects in China, Malaysia and North Africa. Perhaps encouraged by carbon pricing and regulation, empty reservoirs could one day become more valuable than those still full of (stranded) oil and gas, with CCS becoming the core business of companies in the sector. By facilitating greener manufacturing, especially in such high emissions industries as aluminium, concrete and steel, CCS encourages deeper linkages from the oil and gas industry to the wider economy. However, numerous technological challenges remain, not least those of geology. One of the largest CCS projects, Chevron's Gorgon LNG project in Australia has yet to meet its target of 80% CO_2 capture.

86 Shell has invested in India's renewable power company Husk Power Systems.

87 IEA (2020: 20–21). In addition to the biggest IOCs (often referred to as 'Majors'), the 'Independents' control 22% of global oil reserves according to the IEA.

88 On NOCs, see Heller (2018) and Manley et al. (2019).

also vary in their strategies for net zero (if they have one). The largest, Saudi Aramco, is investing billions in renewables, especially solar and hydrogen (with plans to produce green hydrogen using solar energy), though this is exceeded by its vast oil and gas operations. Further down the scale, Colombia's Ecopetrol is also moving into renewables, encouraged by the government's diversification strategy. So is Malaysia's Petronas. These larger NOCs have the managerial and engineering experience to execute very large renewable energy projects at scale, but whether renewables will ever come to dominate their asset portfolios is debateable—as it is for the IOCs. Certainly, some NOCs have become as adept as the IOCs in using modest investments in renewables together with well-crafted net zero messaging (green washing) to manage public relations—as COP28 in Dubai demonstrated yet again.

Box 3: National oil companies

NOCs vary considerably in scope: some directly run most of the operations to extract oil and gas (though often collaborating with private companies or buying in their services) while many of the smaller ones oversee, and collect revenues from, private companies that undertake the bulk of the operations. Moreover, governments have often looked to NOCs for delivery in other areas as well, notably infrastructure construction and sometimes health care.

NOCs receive mixed reviews. From a government perspective, they seem to represent an ideal institution for optimizing the revenue flow from oil and gas for the nation: one that is directly answerable to the state. And in countries with mostly weak government institutions and limited skills, they may be one of the few that can reliably implement projects. However, in running production operations, and when compared to private companies, NOCs can be less efficient, less technologically advanced than IOCs, and less disciplined in their capital expenditures. They are prone to over-staffing and sometimes corruption: all resulting in less, not more, revenue for the exchequer. Examples of NOCs suffering from all or some of these faults include Angola's Sonangol, Mexico's Pemex, and Venezuela's PDVSA.

The NOCs usually cited as more successful include Malaysia's Petronas, Saudi Aramco, and Norway's Equinor. They have maintained vigorous exploration programmes, delivered strong returns on their investments, cut reliance on costly private partners, and encouraged a technocratic class of engineers and managers. Brazil's Petrobras would, until the 'car wash' corruption scandal, have been placed in the 'successful' category, but it now illustrates how NOCs can too easily be derailed by patronage and corruption. NOCs are vulnerable given their positioning at the intersection of public policy, commercial ambition, massive economic rents, and networks of established elites.[89] This is exacerbated by a tendency to non-transparency: only a minority publish full information about their finances and operations.[90]

In sum, NOCs can and do play a valuable economic role. But they need strong oversight and accountability, not least to ensure that they contribute, and do not impede, swifter energy transitions.

As champions of fossil fuels, NOCs can end up dominating the national energy strategy of their countries by virtue of their market knowledge, technical capabilities, and political influence—hydrocarbons are often the largest single source of public revenue.[91] This risk is increased when the government lacks a clearly defined national plan and when responsibilities for energy and environmental issues are spread across weak public institutions which fail to coordinate (requiring an 'all of government approach'). The dangers include more, not less, fossil fuel investment, underinvestment in renewable energy, and a neglect of nature (and the associated economic

89 In Myanmar, for instance (Heller and Delesgues 2016).

90 Some 62% of the NOCs reviewed by Heller and Mihalyi (2019a: 5) had 'weak', 'poor' or 'failing' performance on public transparency. See NRGI's database on NOCs https://resourcegovernance.org/publications/national-oil-company-database.

91 Jensen (2023). See also Heller and Mihalyi (2019b).

opportunities this offers, including carbon sinks). Countries that fail to respond to these dangers will then continue down energy and development pathways that risk leaving them increasingly outside a greener global economy.

As global climate action accelerates, the industry faces the challenges posed by the eventual stranding of proven reserves as markets contract and earnings fall below production costs. Simulations by Cambridge Econometrics for IEA and IRENA suggest that the rapid adoption of renewable and energy-saving technologies could strand some US$1 trillion of fossil fuel assets by 2040.[92] This suggests that companies will need to respond by scaling back production, by closing wells, and by either diversifying into renewables and carbon capture or shrinking (perhaps returning capital to their shareholders).

Yet today, the industry continues to invest in oil and gas despite the IEA's warning that this will cause the 1.5c climate target to be exceeded.[93] Companies do so based on scenarios in which demand growth remains robust. Nonetheless, the industry's oil and gas investments face an increased stranding risk if revenue streams do not match expectations.

In principle, private capital markets shoulder the risks of private investments, but financial regulators are increasingly concerned about the impact of stranding on financial stability (and by implication the public finances if lenders need to be bailed out). As global operators, the IOCs can reduce risks by shedding assets (those with the highest production costs but also assets with the highest scope one and two emissions, which are vulnerable to tighter carbon pricing).

By contrast, the NOCs face bigger risks from stranding as they have a much more concentrated asset base than the IOCs. NOCs such as Mexico's Pemex and Venezuela's PDVSA are highly indebted, with their bonds trading at hefty discounts. [94] Pemex has US$110 billion in debt, and the Mexican government is expected to set aside US$ 8.2 billion to help it meet US$11.2 billion repayments in 2024.[95] The potential for default by highly indebted NOCs (in the event of earlier than expected stranding leading to revenue disappointments) poses a risk to domestic financial systems and a fiscal risk if the domestic and foreign borrowing is government guaranteed (either explicitly or implicitly as, is likely, given that many NOCs are deemed 'too big to fail').

As the global net zero transition accelerates, the producers to be 'the last left standing' are likely to be in the Gulf region, by virtue of their massive reserves and low production costs—'to drill every last molecule' as Saudi Arabia's energy minister bluntly stated.[96] The Kingdom is promoting the (as yet) untested idea of a 'circular carbon economy' (sequestration, offsetting etc.). Governments with smaller reserves and much higher production costs (and higher per barrel emissions) may conclude that they should start winding down production sooner rather than later. Rather than allowing their NOCs to retain revenue to fund new oil and gas investments, using the funds elsewhere—for example to invest in the nation's renewable resource base—may become a

92 IEA and IRENA (2017).

93 IEA (2021, 2023b).

94 Petroleos Mexicanos and Petróleos de Venezuela, S.A.

95 'Mexico's $8bn Backing for Pemex Leaves Problems Unresolved, say Bondholders', Financial Times, September 12, 2023.

96 Prince Abdulaziz bin Salman quoted in Javier Blas 'The Saudi Prince of Oil Prices Vows to Drill 'Every Last Molecule', Bloomberg, July 22, 2021. Aside from its low production costs, Saudi Aramco's pitch to investors, when it was partly privatized in 2019, emphasized its low emissions (scope one and two) per barrel compared to other producing nations and companies.

better strategy for governments.[97] However, most NOCs will be inclined to defend their existing business models which focus on oil and gas. They have considerable political capital (built up over decades), and many governments will be reluctant to shrink what has traditionally been a reliable cash cow for the exchequer—all factors which work against taking determined and early action to change course.

7 Conclusions

Running a company, whether in private or public ownership, no longer amounts to just finding the oil, gas, or mineral, extracting it as efficiently as possible, and then selling it at the best price. There are now multiple environmental and social standards that must also be met. Additionally, all companies must position themselves on the energy transition with clear actions to drive down not just their own emissions (scope one), those of their suppliers (scope two) and, the very hardest part, those of their customers (scope three). It is certainly much harder now for companies, whether public or private, to act in a vacuum separated from the national development and climate strategy. The best companies have increasingly aligned with these national goals (and the UN's SDGs)—at least in their public statements. This paper has highlighted ways for them to deliver more, especially by working in partnership with government to deliver the structural transformation of economies.

The evidence on what companies have actually achieved thus far is mixed. It certainly reveals some positive initiatives by companies—and we have highlighted a few—but there remain many question marks. In part these gaps in our knowledge arise from the huge diversity of companies themselves, and the concentration of much of the available evidence on a small number of the larger and therefore more visible companies amongst them. Responsible companies would do themselves a favour, at a modest cost, if they worked more actively with governments, civil society, and researchers to build a solid evidence base on their development impact, both at local and national levels. This approach would also appeal to ESG investors in helping them differentiate the good companies from the bad.

That said, the toughest countries for companies are the ones in which host governments are ineffective and divisive: in those situations, any positive development impact may at best be confined to local small-scale community projects. Unfortunately, divisive, and ineffective governments also attract the very worst companies—either foreign or established by state actors themselves. But in poorer countries in which the political leadership is committed to inclusive development there are good prospects for companies to contribute more, and as state capacities deepen it then becomes possible to partner with national and local governments to deliver much greater impact.

At the start of 2020, ESG and climate looked set to dominate the attention of chief executives and boards in the decade ahead. And then COVID-19 struck, upending the global economy and commodities markets. An unsteady post-pandemic recovery—still ongoing in China, the principal market for many commodities—and central banks struggling with a resurgence in global inflation, then took a further knock from Russia's attack on Ukraine in early 2022. This has accelerated a reconfiguration of global trade and investment flows, which was already evident in a deterioration in the West's relations with China and Western alarm at China's growing presence in critical minerals extraction and refining. We have entered a new era in geopolitics which looks set to

[97] Manley and Heller (2021).

reverse at least partially the globalization of business that has driven corporate strategy over the last three decades. How chief executives and boards deal with such shocks, and simultaneously re-position themselves for a global net zero economy, will determine whether their companies thrive, or indeed survive, in the years ahead.

References

Addison, T. (2009). 'The Political Economy of the Transition from Authoritarianism'. In P. de Greiff and R. Duthie (eds), *Transitional Justice and Development: Making Connections*, 110-40. New York: Social Science Research Council for the International Center for Transitional Justice.

Addison, T. and T. Brück (eds) (2009). *Making Peace Work: The Challenges of Social and Economic Reconstruction*. London: Palgrave Macmillan for UNU-WIDER. https://doi.org/10.1057/9780230595194

Addison, T., D. Hulme, and R. Kanbur (eds) (2009) *Poverty Dynamics: Inter-Disciplinary Perspectives*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199557547.001.0001

Addison, T., and S.M. Murshed (2005). 'Post-Conflict Reconstruction in Africa: Some Analytical Issues'. In A.K. Fosu and P. Collier (eds), *Post-Conflict Economies in Africa*, 3–17. London: Palgrave Macmillan. https://doi.org/10.1057/9780230522732_1

Addison, T. and A. Roe (2018). 'Extractives for Development: Introduction and Ten Main Messages'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 3–30. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0001

AfDB (2016). *AGA Malaria and Public-Private Partnerships in Ghana's Health Sector to Obtain Value from Extractives Project*s. Abidjan: African Development Bank.

Alova, G. (2018). Integrating Renewables in Mining: Review of Business Models and Policy Implications', OECD Development Policy Paper 14. Paris: Organisation for Economic Co-Operation and Development.

Anglo American (2014). *SEAT Toolbox: Socio-Economic Assessment Toolbox Version 3*. London: Anglo American.

Aubynn, T. (2018). Regulatory Structures and Challenges to Developmental Extractives: Some Practical Observations from Ghana'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 252–74. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0013

Bebbington, A., A.-G. Abdulai, D. Humphreys Bebbington, M. Hinfelaar, and C.A. Sanborn (2018). *Governing Extractive Industries: Politics, Histories, Ideas*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780198820932.001.0001

Bebbington, A., S. Hickey, and D.C. Mitlin (eds) (2008). *Can NGOs Make a Difference? The Challenge of Development Alternatives*. London: Zed Books. https://doi.org/10.5040/9781350218833

Becker, H. A. and F. Vanclay (eds) (2003). *The International Handbook of Social Impact Assessment: Conceptual and Methodological Advances*. Cheltenham: Edward Elgar. https://doi.org/10.4337/9781843768616

Bell, R.G. (2018). 'Protecting the Environment During and After Resource Extraction'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 318-41. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0016

Birol, F., and D. Malpass (2021). 'It's Critical to Tackle Coal Emissions'. World Bank Blog. October.

Bour, A., L. Chaumontet, M. Feth, H. Kuipers, and T. Mónks (2020). 'Mining Needs to Go Faster on Climate'. London: Boston Consulting Group.

Cochrane, G. (2017). *Anthropology in the Mining Industry: Community Relations after Bougainville's Civil War*. London: Palgrave Macmillan. https://doi.org/10.1007/978-3-319-50310-3

Cust, J. (2018). 'The Role of Governance and International Norms for Managing Natural Resources'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 395–421. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0019

Dietsche, E., S. Dodd, D. Haglund, M. Henstridge, M. Jakobsen, E. Sindou and C. Slaven (2013). *Extractive Industries, Development and the Role of Donors*. Oxford: Oxford Policy Management

Dolega, P., and D. Schüler (2018). 'China's Approach Towards Responsible Sourcing'. European Policy Brief 03/2018. Freiburg: EU Strategic Dialogue on Sustainable Raw Materials for Europe (STRADE).

Doron, R., and T. Falola (2016). *Ken Saro-Wira*. Athens OH: Ohio University Press. https://doi.org/10.2307/j.ctv224ttbv

Eisenstadt, T. A. and K. Jones West (2019). *Who Speaks for Nature? Indigenous Movements, Public Opinion, and the Petro-State in Ecuador*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780190908959.001.0001

Ericsson, M., O. Löf, and A. Löf (2020). 'Chinese Control over African and Global Mining—Past, Present and Future', *Mineral Economics*. 33(1–2): 153–81. https://doi.org/10.1007/s13563-020-00233-4

Evans, S (2020). 'Why Coal Use Must Plummet this Decade to Keep Global Warming Below 1.5C', London: Carbon Brief.

Filgueiras, L., A. Rabetim, and I. Aché (2018). 'Approaches to Supporting Local and Community Development: Brazil and the Vale SA Model of Corporate Interaction'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 633-51. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0030

Gold Fields (2023). *Climate Change Report 2022: Creating Enduring Value Beyond Mining*. Johannesburg: Gold Fields.

Harvey, R. (2018). 'Greening South African Mining Through the Fourth Industrial Revolution'. In MISTRA (ed) *The Future of Mining in South Africa: Sunset or Sunrise?*, 144–78. Johannesburg: Mapungubwe Institute for Strategic Reflection. https://doi.org/10.2307/j.ctvgc60w8.10

Heller, P. (2018). 'Doubling Down: National Oil Companies as Instruments of Risk and Reward'. In T. Addison and A. Roe (eds) *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 298–317. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0015

Heller, P., and L. Delesgues (2016). *Gilded Gatekeepers: Myanmar's State-Owned Oil, Gas and Mining Enterprises*. New York: Natural Resource Governance Institute.

Heller, P. and D. Mihalyi (2019a). *Massive and Misunderstood: Data-Driven Insights into National Oil Companies*, New York: Natural Resource Governance Institute.

Heller, P. and D. Mihalyi (2019a). *Massive and Misunderstood: Data-Driven Insights into National Oil Companies*, New York: Natural Resource Governance Institute.

Heller, P. and D. Manley (2019b). *Fiscal Futures: Are National Oil Companies Champions or Obstacles for Energy Transition?,* New York: Natural Resource Governance Institute.

Hickey, S., K. Sen, and B. Bukenya (eds) (2015). *The Politics of Inclusive Development: Interrogating the Evidence*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198722564.001.0001

Hodge, R.A. (2018). 'Towards Contribution Analysis'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 369-94. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0018

Hodge, R.A., and H. Brehaut (2022). 'Towards a Positive Legacy: Key Questions to Assess the Adequacy of Mine Closure and Post-Closure', *Mineral Economics,* 36: 181–86. https://doi.org/10.1007/s13563-022-00339-x

Hodge, R.A., M. Ericsson, O. Löf, A. Löf, and P. Semkowich (2022). 'The Global Mining Industry: Corporate Profile, Complexity, and Change', *Mineral Economics,* 35: 587–606. https://doi.org/10.1007/s13563-022-00343-1

ICMM (2010). *Mapping In-Country Partnerships*. London: International Council on Mining and Metals.

ICMM (2011). *Mining Partnerships for Development: Toolkit*. London: International Council on Mining and Metals.

ICMM (2012). *Community Development Toolkit*. London: International Council on Mining and Metals.

IEA (2020). *The Oil and Gas Industry in Energy Transitions*. Paris: International Energy Agency.

IEA (2021). *Net Zero by 2050: A Roadmap for the Global Energy Sector*. Paris: International Energy Agency.

IEA (2023a). *CO2 Emissions in 2022*. Paris: International Energy Agency.

IEA (2023b). *World Energy Investment 2023*. Paris: International Energy Agency.

IEA and IRENA (2017). *Perspectives for the Energy Transition: Investment Needs for a Low-Carbon Energy System*: Paris: International Energy Agency and International Renewables Energy Agency (IRENA).

IFC (2012). *IFC Performance Standards on Environmental and Social Sustainability*. Washington, DC: World Bank International Finance Corporation.

Jensen, L. (2023). *Global Decarbonization in Fossil Fuel Export-Dependent Economies: Fiscal and Economic Transition Costs*. New York: United Nations Development Programme. https://doi.org/10.2139/ssrn.4509213

Löf, A., M. Ericsson, and O. Löf (2022). 'Marine Mining and its Potential Implications for Low- and Middle-Income Countries', WIDER Working Paper 2022/170. Helsinki: UNU-WIDER. https://doi.org/10.35188/UNU-WIDER/2022/303-1

Lundstøl, O. and J. Isaksen (2018). 'Zambia's Mining Windfall Tax', WIDER Working Paper 2018/51. Helsinki: UNU-WIDER. https://doi.org/10.35188/UNU-WIDER/2018/493-3

Macdonald, C. (2018a). 'The Role of Participation in Sustainable Community Development Programmes in the Extractives Industries'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 591–610. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0028

Macdonald, C. (2018b). 'The Role of Gender in the Extractive Industries'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 442–59. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0021

Manley, D. (2017). 'Ninth Time Lucky: Is Zambia's Mining Tax the Best Approach to an Uncertain Future?'. Briefing. New York: Natural Resource Governance Institute.

Manley, D. and P. Heller (2021). *Risky Bet: National Oil Companies in the Energy Transition*. New York: Natural Resource Governance Institute.

Manley, D., D. Mihalyi, and P. Heller (2019). 'Hidden Giants: It's Time for More Transparency in the Management and Governance Of National Oil Companies', *Finance and Development*. December: 56–59.

McKinsey Sustainability (2020). 'Climate Risk and Decarbonization: What Every Mining CEO Needs to Know'. New York: McKinsey & Company.

McPhail, K. (2018). 'Enhancing Sustainable Development from Oil, Gas, and Mining: From an 'All of Government' Approach to Partnerships for Development'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 342–65. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0017

Mitchell, P. (2019). 'Scope 3 Emissions in the Mining and Metal Sectors' Linkedin Pulse. https://www.linkedin.com/pulse/scope-3-emissions-mining-metal-sectors-paul-mitchell

Mondoloka, A. (2018). 'Approaches to Supporting Local and Community Development: the View from Zambia'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 611–32. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0029

Mwaba, A. and S. Kayizzi-Mugerwa (2021). 'Boosting Mineral Revenues in Zambia: Policy Options for a Sustainable Fiscal Regime', WIDER Working Paper 2021/178. Helsinki: UNU-WIDER. https://doi.org/10.35188/UNU-WIDER/2021/118-1

NRGI (2021). *2021 Resource Governance Index*, New York: Natural Resource Governance Institute.

O'Faircheallaigh, C. (2023). *Indigenous Peoples and Mining: A Global Perspective*, Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780192894564.001.0001

OPM (2013). *Tenke Fungurume Mine: Economic Impact Assessment*. Oxford: Oxford Policy Management.

Otto, J. (2018). 'How Do we Legislate for Improved Community Development?'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 673–94. Oxford: Oxford University Press for UNU-WIDER.

RMI (2018). *Responsible Mining Index Report 2018*. Nyon: Responsible Mining Foundation.

RMI (2019). *Responsible Mining Index: Framework 2020*. Nyon: Responsible Mining Foundation.

RMI (2022). *Responsible Mining Index Report 2022*. Nyon: Responsible Mining Foundation.

Slack, K. (2018). 'Capturing Economic and Social Benefits at the Community Level: Opportunities and Obstacles for Civil Society'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 652–72. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0031

Stewart, F. (2009). 'Policies Towards Horizontal Inequalities in Post-Conflict Reconstruction'. In T. Addison and T. Bruck (eds), *Making Peace Work: The Challenges of Social and Economic Reconstruction*, 136-74. London: Palgrave Macmillan for UNU-WIDER. https://doi.org/10.1057/9780230595194_7

Tomlinson, K. (2018). 'Oil and Gas Companies and the Management of Social and Environmental Impacts and Issues: The Evolution of the Industry's Approach'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, 422–41. Oxford: Oxford University Press for UNU-WIDER. https://doi.org/10.1093/oso/9780198817369.003.0020

TPI (2021). *State of Transition Report 2021*. London: Transition Pathway Initiative.

UNCTAD (2023). *World Investment Report 2023*. Geneva: United Nations Conference on Trade and Development.

UN-OCHR (2011). *Guiding Principles on Business and Human Rights*. Geneva: Office of the United Nations High Commissioner for Human Rights.

WEF (2016). *Mapping Mining to the Sustainable Development Goals: An Atlas*, Cologny: World Economic Forum, United Nations Development Programme, and the Colombia Center for Sustainable Development.

Wood Mackenzie (2022). *How Will Oil and Gas Companies Get to Scope 3 Net Zero?* Edinburgh: Wood Mackenzie.

World Bank (2003). *The Final Report of the Extractive Industries Review*, Washington, DC: World Bank, December.

World Bank (2012). *Mining Community Development Agreements Source Book*, Washington, DC: World Bank.

World Bank (2020). *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*. Washington, DC: World Bank.

Zhou, X., C. Wilson, and B. Caldecott (2021). *The Energy Transition and Changing Financing Costs*. Oxford: Smith School of Enterprise and the Environment, Sustainable Finance Programme.