

# State Ownership and Climate Change Mitigation: Overcoming the Carbon Curse?

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## Abstract

*Climate policies have often focused on the role of State as a regulator. Meanwhile, their role as leading economic actors, especially as shareholders and investors, has been neglected. State-owned enterprises control significant shares of economic sectors which are central to a carbon-intensive economy (e.g. fossil fuels, power generation), in particular in emerging economies. Positioned within a general trend towards active ownership, this article seeks to initiate a debate on the role that State ownership policies could play in mitigating climate change. After assessing the position of State-owned enterprises in relevant sectors and countries, the article explores policy opportunities for State ownership policies not just to divest from unsustainable practices, but to actively lead the way towards a carbon-neutral economy.*

## Keywords

climate change mitigation, non-market approaches, state ownership, divestment

## I. Introduction

Limiting and reducing greenhouse gas emissions requires a large array of efforts. International climate change negotiations, as negotiations between States, have generally focused on the role of States as regulators. At the same time, the role that States can and often do play as leading economic actors has often been neglected. In this sense, the Preamble of the UN Framework Convention on Climate Change (UNFCCC) recalls the principle according to which States have ‘the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction’.<sup>1</sup> Likewise, the Kyoto Protocol puts great emphasis on market mechanisms regulated by States as a way to disincentivize greenhouse gas emissions mostly from private actors.<sup>2</sup> By contrast, the Paris Agreement suggests a more comprehensive approach by recognizing in particular the importance of ‘non-market approaches’ which could ‘promote mitigation ... ambition’ as well as ‘enhance public and private sector participation in the implementation of nationally determined contributions’.<sup>3</sup>

This latter provision of the Paris Agreement relates in part to a better understanding of the limitations of market-based mechanisms. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) recognized a ‘medium agreement’ that the effectivity of cap-and-trade systems ‘has been limited as a result of loose caps or caps that have

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<sup>1</sup> UN Framework Convention on Climate Change (adopted 14 June 1992, entered into force 21 March 1994), 1771 UNTS 107 (UNFCCC) recital 9.

<sup>2</sup> Kyoto Protocol to the UNFCCC (adopted 11 December 1997, entered into force 16 February 2005) 2303 UNTS 148 art 2(1)(a)(v).

<sup>3</sup> FCCC/CP/2015/L.9, 12 December 2015, in force 4 November, art 6(8).

not proved to be constraining'.<sup>4</sup> Yet, the turn to 'non-market approaches' also reflects a growing acknowledgment that mitigation policies need to do more than disincentivize greenhouse gas emissions by (private) economic actors. Substantial changes need to be made to the structure of our economies, from an overall reliance on fossil fuels and wasteful consumption towards more sustainable models of development. As emphasized by the IPCC, 'substantial reductions in emissions would require *large changes in investment patterns* [emphasis added]'.<sup>5</sup> Although these investments come in part from the private sector, the IPCC also noted that 'the role of the public sector is crucial in helping these private investments happen' through establishing an 'enabling environment'.<sup>6</sup>

This article focuses on State ownership and direct State investment as an underutilized policy channel through which governments can seek to establish such an enabling environment and spur changes in prevalent development paradigms. As this article documents, the central economic actors of carbon-intensive economies are often owned by States. Such is the case in particular among companies that extract, refine and distribute oil, gas and coal, as well as among companies that generate power, often through the combustion of these same fossil fuels.

Beyond major decisions of investing in or divesting from particular companies or sectors, ownership grants States influence on the enterprises they own in their role as shareholders and capital contributors. Against this backdrop, exercise of shareholder power and drafting of ownership policies provide States with many opportunities to foster climate change mitigation. To be clear, this article does not argue for or against State ownership in general terms. Rather, taking into account the prevalence of State ownership in relevant sectors and the overall growth of State-owned enterprises (SOEs) and State investment globally, it highlights the relevance of ownership policies to climate change mitigation.

It is submitted that this debate needs to be opened as emerging economies with even broader public ownership are now committing to ambitious mitigation action. The tools used by the European Union to reduce its greenhouse gas emissions, such as an emissions trading scheme, cannot simply be replicated in emerging economies.<sup>7</sup> Instead, specific circumstances need to be taken into account and alternative tools need to be devised. Particularly in the developing country context, Burke et al. have identified a clear research gap on the contribution of State ownership to climate policies.<sup>8</sup>

States can, should and increasingly do use their power as owners to galvanize action towards climate change mitigation. At the very least, however, their ownership policies must not prevent them from fulfilling their climate change mitigation commitments. While there are also legal constraints that give shape to climate-sensitive State ownership, this article aims to review diverse opportunities that arise when climate change mitigation is viewed from the perspective active State ownership.

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<sup>4</sup> IPCC, 'Summary for Policymakers', *Mitigation of Climate Change: WGIII Contribution to the Fifth Assessment Report* (CUP 2015) 28.

<sup>5</sup> *ibid* 26; Paris Agreement (n 3), art 9; UNFCCC Decision 1/CP.16, The Cancún Agreements, FCCC/CP/2010/7/Add.1, para. 99

<sup>6</sup> IPCC, 'Cross-Cutting Investment and Finance Issues', *Mitigation of Climate Change: WGIII Contribution to the Fifth Assessment Report* (CUP 2015) 1211.

<sup>7</sup> See e.g. Yingqi Liu and Ari Kokko, 'Wind Power in China: Policy and Development Challenges' (2010) 38 *Energy Policy* 5520.

<sup>8</sup> M Burke and others, 'Opportunities for Advances in Climate Change Economics' (2016) 352 *Science* 292, 293.

State ownership provides a range of policy opportunities. For instance, States' vast financial power and shareholder rights can be used in a coordinated way to support the large-scale deployment of new technologies, resulting in economies of scale or simply reducing the risks of private investments.<sup>9</sup> More generally, States can exercise economic leadership through their SOEs by demonstrating the economic viability of alternative economic models and by providing a political signal in favour of low-carbon investments. In contrast to most climate change policies targeting the demand side for fossil fuels or altering their price within a particular jurisdiction, State ownership policies can be used to affect the supply side of the equation, thus triggering global processes of economic adjustments incentivizing investments in alternative sources of energy.<sup>10</sup> Active State ownership thus provides an opportunity to overcome the 'carbon curse,' a situation where countries rich with fossil fuels are more likely to emit more greenhouse gasses than they otherwise would and, in the process, to neglect development of less carbon-intensive practices and technologies.<sup>11</sup>

The scope and content of the article bear close resemblance to discussion over the climate change mitigation potential of Sovereign Wealth Funds (SWFs), state-owned investment vehicles that often acquire non-controlling stakes in private companies.<sup>12</sup> Yet, while belonging to the same conceptual universe with and drawing on SWF-related scholarship, this article is primarily interested in companies where States command sole or majority ownership. In many cases, these companies remain isolated from market disciplines and are therefore less prone to climate change investment activism that increasingly shapes climate policy.<sup>13</sup>

The article is structured as follows. Section II provides a general background on State ownership, while section III traces State ownership in sectors relevant to climate change mitigation. On these bases, section IV discusses opportunities for ownership to be used as a tool for climate change mitigation.

## II. Background: Regimes of State Ownership

State-owned enterprises (SOEs) are corporate entities in which a State exercises control through ownership. A heterogeneous category, SOEs can be fully or part-owned; private or listed; owned by central and federal governments or by regional or local authorities. A number of definitions as to the threshold of control exist: while the United Nations Conference on Trade and Development (UNCTAD) defines control as a stake of more than 10 percent of the voting power,<sup>14</sup> most of the statistics compiled by the Organisation for Economic Co-operation and Development (OECD) opt for a threshold of more than 50 percent of the voting rights or

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<sup>9</sup> IPCC, 'Cross-Cutting Investment and Finance Issues', *Mitigation of Climate Change: WGIII Contribution to the Fifth Assessment Report* (CUP 2015) 1224-1226.

<sup>10</sup> John Mitchell, Valérie Marcel and Beth Mitchell, 'Oil and Gas Mismatches : Finance, Investment and Climate Policy' (*Chatham House Research Paper*, 2015) 39 <[https://www.chathamhouse.org/sites/files/chathamhouse/field/field\\_document/20150709OilGasMismatchesMitchellMarcelMitchellUpdate.pdf](https://www.chathamhouse.org/sites/files/chathamhouse/field/field_document/20150709OilGasMismatchesMitchellMarcelMitchellUpdate.pdf)>.

<sup>11</sup> Jörg Friedrichs and Oliver Inderwildi, 'The Carbon Curse: Are Fuel Rich Countries Doomed to High CO2 Intensities?' (2013) 62 *Energy Policy* 1356.

<sup>12</sup> Danyel Reiche, 'Sovereign Wealth Funds as a New Instrument of Climate Protection Policy? A Case Study of Norway as a Pioneer of Ethical Guidelines for Investment Policy' (2010) 35 *Energy* 3569. See also Benjamin Richardson, *Fiduciary Law and Responsible Investing. In Nature's Trust* (Routledge 2013).

<sup>13</sup> Sonja van Rensen, 'Investors Take Charge of Climate Policy' (2014) 4 *Nature Climate Change* 241; Julie Ayling and Neil Gunningham, 'Non-State Governance and Climate Policy: The Fossil Fuel Divestment Movement' (2015) 17 *Climate Policy* 131; Raj Thamotheram, 'What Impact Could Divestment Have on Share Price and the Energy Sector? Part 2' *Responsible Investor* (23 April 2014) <[https://www.responsible-investor.com/home/article/rt\\_ff/](https://www.responsible-investor.com/home/article/rt_ff/)>.

<sup>14</sup> UNCTAD, 'World Investment Report 2011' (2011) 28 <<http://www.unctad-docs.org/files/UNCTAD-WIR2011-Full-en.pdf>>.

equivalent degree of control.<sup>15</sup> The autonomy of SOEs and their relationship with owner governments varies greatly. Some SOEs, such as Russia's Gazprom,<sup>16</sup> are deeply entwined in shaping and enforcing economic and strategic policies, while others such as Norway's Statoil are well-insulated from governmental interference by a robust governance framework.<sup>17</sup>

Traditionally, SOEs have been prevalent mostly in domestic markets, usually spanning from utilities and infrastructure to energy development.<sup>18</sup> Over the past decade, however, SOEs have rapidly internationalized and emerged as crucial actors across political, economic and legal planes.<sup>19</sup> Brazil, India, Russia and China, in particular, have relied greatly on internationalizing State ownership in their development paradigms.<sup>20</sup> As an illustration, the vast majority of Chinese US\$25 billion energy investments in Europe were channelled through State-owned or State-supervised companies between 2008 and 2015.<sup>21</sup>

Following successive reforms over the past decades, the prevailing ownership model puts emphasis on SOEs' independence and limits States' influence to formal use of shareholder rights.<sup>22</sup> At the same time, however, many SOEs with autonomous boards of directors remain strongly influenced by informal networks and career opportunities such as the *guanxi* system in China.<sup>23</sup>

Typical shareholder rights include the right to participate and vote in shareholder meetings, to obtain relevant and sufficient information on the corporation on a timely and regular basis, to elect and remove members of the board, to approve extraordinary transactions, and to vote on dividend distribution.<sup>24</sup> More generally, shareholders maintain active relationship with the company's management and participate in setting performance metrics for the board. The actual content and scope of shareholder rights is however contingent to specific arrangements. State shareholders sometimes hold a separate class of 'golden' shares that gives them greater voting rights.<sup>25</sup> In other cases, States may forgo their voting rights altogether to appease other shareholders to the company. But even when States do not exercise shareholding power, they exercise influence through their financial leverage (e.g. in case of recapitalization) as well as through their ability to redefine the rules of the games by privatising and through other

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<sup>15</sup> Hans Christiansen and Yunhen Kim, 'State-Invested Enterprises in the Global Marketplace: Implications for a Level Playing Field' (*OECD Corporate Governance Working Papers, No. 14*, 2014) 6 <<http://dx.doi.org/10.1787/5jz0xvfv16nw-en>>.

<sup>16</sup> Nadeja Victor and Inna Sayfer, 'Gazprom: The Struggle for Power' in Victor, Hults and Thurber (eds), *Oil and Governance: State-owned Enterprises and the World Energy Supply* (Cambridge University Press 2012).

<sup>17</sup> Mark Thurber and Benedicte Tangen Istad, 'Norway's Evolving Champion: Statoil and the Politics of State Enterprise' in Victor, Hults and Thurber (eds) (n 16).

<sup>18</sup> OECD, 'Guidelines on Corporate Governance of State-Owned Enterprises (2015 Edition)' (2015) <<http://www.oecd.org/daf/ca/OECD-Guidelines-Corporate-Governance-SOEs-2015.pdf>>.

<sup>19</sup> Przemyslaw Kowalski and others, 'State-Owned Enterprises: Trade Effects and Policy Implications (OECD Trade Policy Papers, No. 147)' (*OECD Trade Policy Papers, No. 147*, 2013) <<http://dx.doi.org/10.1787/5k4869ckqk7l-en>>; Alvaro Cuervo-Cazurra and others, 'Governments as Owners: State-Owned Multinational Companies' (2014) 45 *Journal of International Business Studies* 919; UNCTAD, 'World Investment Report 2015' (2015) iii <[unctad.org/en/PublicationsLibrary/wir2015\\_en.pdf](http://unctad.org/en/PublicationsLibrary/wir2015_en.pdf)>.

<sup>20</sup> OECD, *State-Owned Enterprises in the Development Process* (OECD Publishing 2015).

<sup>21</sup> Stephan Liedtke, 'Chinese Energy Investments in Europe: An Analysis of Policy Drivers and Approaches' (2017) 101 *Energy Policy* 659.

<sup>22</sup> Aldo Musacchio and Sergio Lazzarini, *Reinventing State Capitalism. Leviathan in Business, Brazil and Beyond* (Harvard University Press 2014).

<sup>23</sup> See e.g. Yadong Luo, Ying Huang and Stephanie Lu Wang, 'Guanxi and Organizational Performance: A Meta-Analysis' (2012) 8 *Management and Organization Review* 139 and Li-Wen Lin, 'State Ownership and Corporate Governance in China: An Executive Career Approach' (2013) *Columbia Business Law Review* 743.

<sup>24</sup> OECD (n 18).

<sup>25</sup> Bernardo Bortolotti and Mara Faccio, 'Government Control of Privatized Firms' (2009) 22 *Review of Financial Studies* 2907.

regulatory changes or legislative reforms.<sup>26</sup> Moreover, public procurement functions as a similar leverage tool in many States, including China.<sup>27</sup>

Despite significant privatization programmes in several countries, SOEs remain important actors in many sectors of the economy, particularly those of greatest strategic importance for climate change mitigation. Since 2005, the OECD has developed and updated Guidelines on Corporate Governance of State-owned enterprises, promoting the idea that States should clearly define the rationale for ownership and exercise ownership ‘in the interest of the general public’.<sup>28</sup> The Guidelines have contributed to advance a perspective of State ownership as a policy tool which States should use by acting in an ‘informed and active’ way.<sup>29</sup> Active use of shareholder rights underpins the ownership policy which can be used for diverse objectives of general interest such as the delivery of public goods or services, the efficient operation of a natural monopoly, or support to broad strategic goals such as control over certain sectors.<sup>30</sup>

The OECD’s policy prescriptions on active State ownership build on and reflect more constitutive developments where shareholders are expected to take a larger role in management and control of companies.<sup>31</sup> Over the past two decades, *investor engagement* and *active ownership* have been used by shareholders, particularly large institutional investors, to successfully promote change at investee companies.<sup>32</sup> Moreover, imperatives of active ownership are increasingly embedded in institutional best practices, such as the UK Stewardship Code,<sup>33</sup> and binding regulation as is the case with the recent Shareholder Rights Directive in the EU.<sup>34</sup> At least since the Financial Crisis, active exercise of shareholder rights has been adopted as part of State ownership policy across the world, for instance by the World Bank,<sup>35</sup> the IMF-supported International Forum on Sovereign Wealth Fund,<sup>36</sup> and by multiple governments, including China.<sup>37</sup>

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<sup>26</sup> Karl-Heinz Böckstiegel, ‘Enterprise v. State: The New David and Goliath?’ (2007) 23 *Arbitration International* 93; Rudolf Dolzer and Christoph Schreuer, *Principles of International Investment Law* (OUP 2008).

<sup>27</sup> Ming Du, ‘China’s State Capitalism and World Trade Law’ (2014) 63 *International and Comparative Law Quarterly* 409, 425–426.

<sup>28</sup> OECD (n 18) 19. See also Mikko Rajavuori, ‘Governing the Good State Shareholder: The Case of the OECD Guidelines on Corporate Governance of State-Owned Enterprises’ *European Business Law Review* (forthcoming 2018).

<sup>29</sup> OECD (n 18) 20.

<sup>30</sup> OECD, *State-Owned Enterprise Governance. A Stocktaking of Government Rationales for Enterprise Ownership* (OECD Publishing 2015).

<sup>31</sup> See e.g. Lucian Bebchuk, ‘The Case for Increasing Shareholder Power’ (2005) 118 *Harvard Law Review* 833. For a recent analysis, see Terry McNulty and Donald Nordberg, ‘Ownership, Activism and Engagement: Institutional Investors as Active Owners’ (2016) 24 *Corporate Governance: An International Review* 346.

<sup>32</sup> Serdar Çelik and Mats Isaksson, ‘Institutional Investors as Owners: Who Are They and What Do They Do?’ (*OECD Corporate Governance Working Papers, No. 11*, 2013) <<http://dx.doi.org/10.1787/5k3v1dvmfk42-en>>.

<sup>33</sup> Financial Reporting Council, ‘The UK Stewardship Code’ (2012) <<https://www.frc.org.uk/Our-Work/Publications/Corporate-Governance/UK-Stewardship-Code-September-2012.pdf>>. See also Iris Chiu, ‘Turning Institutional Investors into “Stewards”: Exploring the Meaning and Objectives of “Stewardship”’ (2013) 66 *Current Legal Problems* 443.

<sup>34</sup> Directive 2007/36/CE, OJ L 184, 14.7.2007.

<sup>35</sup> World Bank, ‘Corporate Governance of State-Owned Enterprises: A Toolkit.’ (2014) <<https://openknowledge.worldbank.org/bitstream/handle/10986/20390/9781464802225.pdf?sequence=1>>.

<sup>36</sup> International Working Group of Sovereign Wealth Funds, ‘Generally Accepted Principles and Practices’ (Santiago Principles) (October 2008) <[http://www.ifswf.org/sites/default/files/santiagoprinciples\\_0\\_0.pdf](http://www.ifswf.org/sites/default/files/santiagoprinciples_0_0.pdf)>.

<sup>37</sup> SASAC, ‘Guidelines to the State-Owned Enterprises Directly under the Central Government on Fulfilling Corporate Social Responsibilities’ (2008) <<http://en.sasac.gov.cn/n1408035/c1477196/content.html>>. For unique traits of the Chinese system, see Li-Wen Lin and Curtis Milhaupt, ‘We Are the (National) Champions: Understanding the Mechanisms of State Capitalism in China’ (2013) 65 *Stanford Law Review* 697.

Active State ownership could readily be used to spur or accelerate the transition to a carbon-neutral economy. Already, there is at least anecdotal evidence of consideration for environmental protection acting as a justification for State ownership. For instance, the law establishing PEMEX, the Mexican State-owned petroleum company, mentions the objective of ‘generating economic value, in favour of the Mexican society, in an environmentally responsible manner’.<sup>38</sup> More frequently, State ownership has been guided by strategic considerations such as energy security and economic development, leading to substantial State ownership in fossil fuel extraction, refinement and distribution, power generation, and some large industrial sectors (e.g. steel, cement).<sup>39</sup>

It is striking, however, that these sectors of strategic economic importance are also key to climate change mitigation efforts. The control that States exercise through ownership in order to support the foundations of a carbon-intensive economy is a potent tool to bring about a transition to a carbon-neutral economy.<sup>40</sup>

### III. State Ownership Relevant to Climate Change Mitigation

States have often maintained a strong ownership position in several sectors which are keys to climate change mitigation efforts. This section explores two sectors of greatest relevance: fossil fuels extraction, refinement and distribution (1.) and power generation (2.).

#### 1. State Ownership in the Fossil Fuel Sector

States have generally kept strong ownership position – often full ownership – in powerful enterprises extracting, refining and distributing fossil fuels. The International Energy Agency estimates that SOEs possess 71% of proven-plus-probable reserves of oil and gas, including 80% of oil reserves and 60% of natural gas reserves.<sup>41</sup> Victor, Hults and Thurber attributed 61% of global oil production and 52% of global gas production to SOEs.<sup>42</sup> While private-sector oil and gas companies typically have known reserves that cover 10-15 years at their current extraction pace, SOEs’ own reserves have been projected to last for 50-100 years.<sup>43</sup>

The situation is more contrasted with regard to coal, with SOEs controlling only 9% of the national production of coal in OECD countries but 66% in non-OECD countries.<sup>44</sup> In emerging economies that rely heavily on coal, such as China, India and Vietnam, coal production is almost entirely State-owned.<sup>45</sup> This correlation between State ownership and prevalence of coal in the national energy mix suggests a mutual causal relation where the strategic importance of coal leads to public investment which, in turn, reinforces production capacity and economic reliance on coal. This development has been investigated through the lens of ‘carbon curse’ or ‘fossil fuel curse,’ a modified version of the more well-known ‘resource curse’ theory, which

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<sup>38</sup> OECD (n 30) 18.

<sup>39</sup> David Victor, David Hults and Mark Thurber, ‘Introduction and Overview’ in Victor, Hults and Thurber (eds) (n 16).

<sup>40</sup> This idea resonates strongly with recent advances made in the field of innovation economics, which revealed the positive role that States play in fostering innovation and economic growth. See e.g. Mariana Mazzucato, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths* (Revised ed, Anthem Press 2014).

<sup>41</sup> International Energy Agency, ‘World Energy Investment Outlook’ (2014) 33, 53 <<https://www.iea.org/publications/freepublications/publication/WEIO2014.pdf>>.

<sup>42</sup> Victor, Hults and Thurber, ‘Introduction and Overview’. See also US Energy Information Administration, ‘Who Are the Major Players Supplying the World Oil Market?’ (2016) <[http://www.eia.gov/energy\\_in\\_brief/article/world\\_oil\\_market.cfm](http://www.eia.gov/energy_in_brief/article/world_oil_market.cfm), attributing 58% of global oil production to SOEs.

<sup>43</sup> Mitchell, Marcel and Mitchell (n10) 34–35.

<sup>44</sup> International Energy Agency (n 41) 56–57.

<sup>45</sup> *ibid.*

posits that countries with rich fossil fuel endowments are likely to emit more greenhouse gasses than they otherwise would and, in the process, to neglect development of less carbon-intensive practices and technologies.<sup>46</sup>

Many national fossil fuel companies extend operations beyond national borders and have facilitated the establishment of a global carbon-based economy. Richard Heede has retraced the current and historical global greenhouse gas emissions resulting from the combustion of fossil fuels produced by the 90 largest corporations, 31 of which are SOEs. According to their data, more than a fifth of current greenhouse gas emissions can be traced to just twelve large SOEs which extract, refine and distribute fossil fuels in multiple States and trade them across international borders (table 1). Beyond SOEs, it is noteworthy that States' financial involvement extends to significant minority participation within private corporations, usually through SWF investments.<sup>47</sup> Qatar, for instance, currently owns 4.6% of the capital of Shell and 3% of the capital of Total,<sup>48</sup> while Norway possesses respectively 2 % and 1.6 % of the capitals of the same companies.<sup>49</sup>

[Insert Table 1 here]

**Table 1. Greenhouse gas emissions traceable to twelve selected SOEs<sup>50</sup>**

NFFC	Controlling State (share of ownership)	Current (% of global, 2010)	Historical (% of global)
Saudi Aramco	Saudi Arabia (100 %)	4.3 %	3.2 %
Gazprom	Russia (50.2 %)	3.8 %	2.2 %
National Iran Oil	Iran (100 %)	2.4 %	2.0 %
Pemex	Mexico (100 %)	1.7 %	1.4 %
PD Venezuela	Venezuela (100 %)	1.4 %	1.1 %
Coal India	India (79.7 %)	2.3 %	1.1 %
PetroChina	China (86.4 %)	1.7 %	0.7 %
Kuwait Petroleum	Kuwait (100 %)	0.9 %	0.7 %
Abu Dhabi NOC	UAE (100 %)	1.1 %	0.7 %
Sonatrach	Algeria (100 %)	1.1 %	0.6 %
Petrobras	Brazil (54 %)	0,9 %	0.4 %
Rosneft	Russia (69.5 %)	1,0 %	0.2 %
<b>TOTAL</b>		<b>20.7%</b>	<b>14.3%</b>

Ownership, whether full, majority or minority, gives States influence within the company. Through exercising formal shareholder rights in general meetings, influencing the board composition, setting metrics for the board to meet and influencing major corporate decisions, including through informal interaction between State officials and SOE managers, State shareholders' behaviour is key to effective climate change mitigation. Such decisions regard not only the rate of extraction, but also the priority that could be given to less carbon-intensive

<sup>46</sup> Friedrichs and Inderwildi (n 11); Filip Johnsson and Jan Kjærstad, 'Regional Distribution of Renewable Energy and the Abundance of Fossil Fuels' in Guangxi Yue and Shuiqing Li (eds), *Clean Coal Technology and Sustainable Development* (Springer 2016).

<sup>47</sup> Ruth Aguilera, Javier Capapé and Javier Santiso, 'Sovereign Wealth Funds: A Strategic Governance View' (2016) 30 *Academy of Management Perspectives* 5.

<sup>48</sup> A Sambridge, 'Qatar's SWF Takes Stake in Royal Dutch Shell (11 May 2012)' *Arabian Business* (2012).; Bloomberg, 'Qatar Increases Stake in Europe's Total to 3% (21 April 2012)' *Arabian Business* (2012) <[http://www.arabianbusiness.com/qatar-increases-stake-ineurope-s-total-3--454733.html#.V6xdp\\_196Uk](http://www.arabianbusiness.com/qatar-increases-stake-ineurope-s-total-3--454733.html#.V6xdp_196Uk)>.

<sup>49</sup> Norges Bank Investment Management, 'Holdings' (2017) <<https://www.nbim.no/en/the-fund/holdings/>>.

<sup>50</sup> GhG data based on Richard Heede, 'Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854-2010' (2014) 122 *Climatic Change* 229; share of state ownership were traced from multiple sources as of early-2017.

fossil fuels (for instance gas instead of oil, or different grades of coal), to less energy-intensive extraction techniques, or to reduce greenhouse gas emissions through flaring and during transportation.<sup>51</sup>

## 2. State Ownership in the Power Sector

Beyond fossil fuels, SOEs have also played an important role in power generation. The International Energy Agency estimates that SOEs ‘own nearly half of the world’s power generation assets.’<sup>52</sup> State ownership in the power sector is prevalent in emerging economies like China, India and Southeast Asian States, where it represents about two thirds of the sector’s output, compared with the European Union (45%) and the United States (20%).<sup>53</sup> The rate of State ownership often varies within each country in relation to the source of energy. China’s SOEs, for instance, control 61% of installed coal power capacity, but less than 30% of non-hydro renewable energies.<sup>54</sup>

Power generation is the largest source of greenhouse gas emissions throughout the world, responsible for more than a third of current greenhouse gas emissions.<sup>55</sup> Ownership policies in this sector are of paramount importance to climate change mitigation, in particular in emerging economies with powerful SOEs. These SOEs could be an opportunity for States like China and India to play a role for instance in rapidly increasing the efficiency of power generation and developing sources of power alternative to fossil fuel combustion. SOEs in the power sector can also collaborate with SOEs in the fossil fuel sector, for instance in order to develop carbon capture and storage projects.

China exemplifies the ability of a government to alter its energy sources through ownership policies probably faster than it would be possible through sectoral regulation.<sup>56</sup> An increasing awareness of the impacts of air pollution in cities certainly played a role in the apparent drop of coal consumption – a reduction by 2.9% in 2014 and 3.7% in 2015<sup>57</sup> – following years of rapid expansion fostered by aggressive capacity targets and low-cost debt.<sup>58</sup> Through investments carried out by SOEs since 2003, China has rapidly developed a global leadership in equipment manufacturing and generation of wind and solar power.<sup>59</sup>

## **IV. Ownership as a Tool for Climate Change Mitigation**

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<sup>51</sup> Flaring and transportation of fossil fuels represent a daunting 6 percent of global greenhouse gas emissions. See IPCC, ‘Introductory Chapter’ in *Mitigation of Climate Change: Working Group III Contribution to the Fifth Assessment Report* (CUP 2015) 123.

<sup>52</sup> International Energy Agency (n 41) 33.

<sup>53</sup> *ibid.* 95.

<sup>54</sup> David Nelson and others, ‘Slowing the Growth of Coal Power in China: The Role of Finance in State-Owned Enterprises’ (*Climate Policy Initiative*, 2015) 1 <<https://climatepolicyinitiative.org/wp-content/uploads/2015/12/Slowing-the-Growth-of-Coal-Power-in-China---the-Role-of-Finance-in-State-Owned-Enterprises.pdf>>.

<sup>55</sup> IPCC, ‘Energy Systems’, *Climate Change 2014: Mitigation of Climate Change: WGIII Contribution to the Fifth Assessment Report* (CUP 2015) 516.

<sup>56</sup> Alex Wang, ‘Chinese State Capitalism and the Environment’ in Benjamin Liebman and Curtis Milhaupt (eds), *Regulating the Visible Hand? The Institutional Implications of Chinese State Capitalism* (CUP 2016).

<sup>57</sup> Sophie Yeo, ‘Analysis: Decline in China’s Coal Consumption Accelerates (29 February 2016)’ (*Carbon Brief*, 2016) <<https://www.carbonbrief.org/analysis-decline-in-chinas-coal-consumption-accelerates>>.

<sup>58</sup> Huw Slater, ‘Insights: China’s Coal Power Stranded Assets Challenge’ (*China Carbon Forum*, 2016) 1 <<http://www.chinacarbon.info/wp-content/uploads/2014/09/China-Carbon-Forum-Insights-April.pdf>>.

<sup>59</sup> Henrik Bergsager and Anna Korppoo, *China’s State-Owned Enterprises as Climate Policy Actors The Power and Steel Sectors* (2013) 45-46 <<http://norden.diva-portal.org/smash/get/diva2:702164/FULLTEXT01.pdf>>.

State ownership policies may be an effective tool for States to pursue climate change mitigation and an opportunity to break the ‘carbon curse.’ One obvious option is for States to massively divest from all carbon-intensive sectors and to re-invest in sectors essential to a green economy (e.g. renewable energies). But States can also use SOEs in carbon-intensive sectors such as fossil fuel and power generation to spur a gradual turn to more sustainable development models.

### 1. Leave it or Lead it?

An active civil society campaign led by 350.org has called for divestment from fossil fuels. This campaign has mostly attempted to spur ‘enlightened private behaviour’<sup>60</sup> in reaction to what was perceived as a failure of public authorities to make sufficient efforts on climate change mitigation.<sup>61</sup> Yet, many of the targeted investors were actually public institutions such as State-owned universities, city administrations, and SWFs. Those which committed to divest from fossil fuel include the cities of San Francisco, Seattle and Portland in the United States, or Melbourne and Newcastle in Australia, as well as public academic institutions such as the Australian National University and the London School of Oriental and African Studies in the United Kingdom.<sup>62</sup> Other public institutions have divested more selectively from certain companies in order to favour particular business practices. Thus, the Norwegian Pension Fund Global – the world’s largest SWF – massively divested from coal companies after a decision of its management that the Norwegian Parliament later endorsed.<sup>63</sup> Likewise, the city of Oslo divested from coal<sup>64</sup> and the University of California, from coal and tar sands.<sup>65</sup>

While affecting minority holdings, however, the divestment campaign has not had a decisive impact on States’ full, majority, or controlling minority ownership in large SOEs.<sup>66</sup> It seems rather difficult for advocacy to alter States’ massive investments in the fossil fuel sector and other carbon-intensive activities.<sup>67</sup> Moreover, even though the divestment campaign plays an important role in raising awareness, it may not necessarily be the best way to foster mitigation action.<sup>68</sup> Less investment could disproportionately affect the poorer populations, rather than the greater emitters, and thus be inconsistent with equitable principles and with the principle of common but differentiated responsibilities and respective capabilities.<sup>69</sup> It could encourage

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<sup>60</sup> Ayling and Gunningham (n 13) 8.

<sup>61</sup> van Renssen (n 13).

<sup>62</sup> For a list of commitments, see the website of the campaign organized by 350.org. Fossil Free, ‘Divestment Commitments’ <<http://gofossilfree.org/commitments/>>. For a legal perspective on divestment campaigns in the higher education sector, see Benjamin Richardson, ‘Universities Unloading on Fossil Fuels: The Legality of Divesting’ (2016) 10 *Carbon & Climate Law Review* 62.

<sup>63</sup> See Norges Bank Investment Management, ‘Responsible Investment Report 2015’ (2015) <<http://www.nbim.no/contentassets/96608d5f04eb4a138fa88f8fd937b70/responsible-investment-2015.pdf>>; Norges Bank Investment Management, ‘Climate Change Strategy. Expectations to Companies’ (2016) <<http://www.nbim.no/contentassets/27ce1a7cbf0b4bba9d4d94bd23165e46/climate-change-strategy-document.pdf>>; John Schwartz, ‘Norway Will Divest from Coal in Push Against Climate Change (5 June 2015)’ *New York Times* (5 June 2015) <<https://www.nytimes.com/2015/06/06/science/norway-in-push-against-climate-change-will-divest-from-coal.html>>.

<sup>64</sup> Damian Carrington, ‘Oslo Diverts from Coal Companies’ *The Guardian* (2 March 2015) <<https://www.theguardian.com/environment/2015/mar/02/oslo-divests-from-coal-companies>>.

<sup>65</sup> Emma Howard, ‘California University Divests \$200m from Coal and Tar Sands Holdings’ *The Guardian* (10 September 2015) <<https://www.theguardian.com/environment/2015/sep/10/california-university-divests-200m-from-coal-and-tar-sands-holdings>>.

<sup>66</sup> Thamotheram (n 13); Ayling and Gunningham (n 13) 4-5.

<sup>67</sup> Johnsson and Kjærstad (n 46).

<sup>68</sup> Andreas Follesdal, ‘Engagement, Divestment or Both? Conflicts and Interactions: The Case of the Norwegian Pension Fund’ in Juan Pablo Bohoslavsky and Jerneh Letnar Černic (eds), *Making Sovereign Financing and Human Rights Work* (Hart 2014).

<sup>69</sup> UNFCCC (n 1) art 3(1); Sunita Narain, ‘How Power Can Be Cleaned’ *Down to Earth* (31 March 2015) <<http://www.downtoearth.org.in/blog/how-power-can-be-cleaned-48976>>.

a shift to coal, which requires comparatively less initial investment than oil and gas. Significant investments may be needed to generate incremental improvements on the short to medium term, for instance for a reduction of greenhouse gas emissions in the process of extracting, refining and distributing fossil fuels or for the deployment of more efficient thermal plants. Overall, a significant public divestment from carbon-intensive sectors would result in the loss of a great opportunity for States to spur sectorial reforms consistent with their mitigation objectives, instead passing the baton to less conscientious private investors.<sup>70</sup>

## 2. Leadership Opportunities

Like any other State policy, ownership should seek to fulfil objectives of general interest.<sup>71</sup> This is recognized, for instance, by the OECD Guidelines on Corporate Governance of State-Owned Enterprises, according to which '[t]he ultimate purpose of state ownership of enterprises should be to maximize value for society'.<sup>72</sup> State ownership policies can contribute to general interests in multiple ways, for instance by laying the foundations for economic development or by promoting 'high standards of responsible business conduct'.<sup>73</sup> Ownership also provides an opportunity for States to 'lead by example', more specifically, towards a sustainable development. While the climate regime puts great emphasis on market-based mechanisms, little attention has generally been given to the potential of ownership policies in developing new economic practices. Already, in the case of China, it has been observed that '[v]arious policies launched by the Chinese bureaucracy rely on tasking the SOEs to proceed with policy implementation'<sup>74</sup> and that 'SOEs will play a greater role in Chinese environmental reform than commonly thought.'<sup>75</sup>

Firstly, SOEs can seek to conduct their operations in a more sustainable way. In the fossil fuel sector, this hints at effort to reduce the enormous amounts of greenhouse gas emissions that arise from the operation of fossil fuel companies – 6% of global greenhouse gas emissions.<sup>76</sup> To this regard, the IPCC identified technical solutions such as 'the capture or oxidation of coal bed methane, the reduction of venting and flaring in oil and gas systems, as well as energy efficiency improvements and the use of low-GHG energy sources in the fuel chain'.<sup>77</sup> Several SOEs have participated in the 'Zero Routine Flaring by 2030' initiative along with privately owned enterprises.<sup>78</sup> Likewise, in the power sector, SOEs could play a role in promoting more efficient thermal plants and electrical grids.<sup>79</sup>

Secondly, SOEs can turn to more sustainable activities, including, when possible, through economic diversification. This can involve simply putting greater priority to activities that result in less greenhouse gas emission, for instance through a renunciation to the least energy

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<sup>70</sup> Wang (n 56) 253. See also Ye Qi and others, 'Translating a Global Issue Into Local Priority: China's Local Government Response to Climate Change' (2008) 17 *The Journal of Environment & Development* 379; Mike Hulme, 'Why Fossil Fuel Divestment Is a Misguided Tactic' *The Guardian* (17 April 2015) <<https://www.theguardian.com/environment/2015/apr/17/why-fossil-fuel-divestment-is-a-misguided-tactic>>.

<sup>71</sup> Dag Detter and Stefan Fölster, *The Public Wealth of Nations: How Management of Public Assets Can Boost or Bust Economic Growth* (Palgrave Macmillan 2015).

<sup>72</sup> OECD (n 18) 19.

<sup>73</sup> *ibid* 25.

<sup>74</sup> Bergsager and Korppoo (n 59) 57.

<sup>75</sup> Wang (n 56) 253.

<sup>76</sup> Nelson and others 1.

<sup>77</sup> IPCC (n 55) 527.

<sup>78</sup> World Bank, 'Zero Routine Flaring by 2030' <<http://www.worldbank.org/en/programs/zero-routine-flaring-by-2030>>.

<sup>79</sup> However, it has to be noted that opening up SOE-led sectors has in many cases led to greater competition and dramatically more efficient and carbon-friendly technologies. See David Victor, Charles Kennel and Veerabhadran Ramanathan, 'The Climate Threat We Can Beat: What It Is and How to Deal with It' (2012) 91 *Foreign Affairs* 112.

efficient unconventional extraction processes (e.g. oil sands and oil shale) or additional efforts to extract only coal with a higher energy/carbon ratio. This can also involve new technological developments, such as carbon capture and storage techniques, where Norway's Statoil, Brazil's Petrobras, China's Petrochina and Sinopec, and Saudi Arabia's Aramco have pioneered,<sup>80</sup> sometimes in partnership with State-owned power companies. Even further from their current activities, large SOEs can also get progressively involved in renewable energies. Petrobras thus emerged as one of the pioneers in the production of ethanol from sugarcane and, in 2008, it created a subsidiary company dedicated to the production of biofuels.<sup>81</sup> Following policy orientations of the Chinese government, Sinopec and Petrochina have invested in the production of ethanol, biodiesel and geothermal energy<sup>82</sup> while all of the 'five major' SOEs in the Chinese power sector invested massively in renewable energies.<sup>83</sup> Chinese SWFs have also increasingly invested in renewable energies.<sup>84</sup> Such economic diversification not only helps developing renewable energy and generating economies of scale, but it also alleviates vested interests that could hinder mitigation policies in States with powerful SOEs.

Thirdly and overall, SOEs can contribute to a paradigm change, from a carbon-intensive to a more sustainable economic model. It was justly noted that the reform of Mexico's PEMEX in the early 2000s, shifting to a much less wasteful economic model, 'made it a leader within the government, within the Mexican private sector, and within the region.'<sup>85</sup> Large SOEs in the fossil fuel and power sector are capable of testing and demonstrating the viability of best practices, whether consisting in more sustainable ways to carry out the same activities or in gradual economic diversification towards more sustainable sectors – thus showing the way to the private sector. They can lead not only within a State, but also beyond, as technologies and economic models stop at no borders. Through their ownership policies, States can indicate their genuine commitment to the fundamental economic changes required for a transition to a carbon neutral society.

This is not to suggest that State ownership policies are a magic bullet. SOEs remain constrained by the market in conjunction to the ability and willingness of their owning State to financially support them. Some unsuccessful investments in renewable energy were for instance among the causes that led New Zealand's Solid Energy to go into administration.<sup>86</sup> Some SOEs like Pemex and Statoil have however made subtle but real differences without endangering their economic profitability. Another difficulty may appear when SOEs attempt to defend the status

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<sup>80</sup> Klaas van Alphen and others, 'The Performance of the Norwegian Carbon Dioxide, Capture and Storage Innovation System' (2009) 37 *Energy Policy* 43; JMM Ketzer and others, 'Brazilian Atlas of CO2 Capture and Geological Storage' (2015) <<http://hub.globalccsinstitute.com/sites/default/files/publications/190903/brazilian-atlasco2-capture-geological-storage.pdf%0A%0D>>; Peter Viebahn, Daniel Vallentin and Samuel Höller, 'Prospects of Carbon Capture and Storage (CCS) in China's Power Sector – An Integrated Assessment' (2015) 157 *Applied Energy* 229; Global CCS Institute, 'Large-Scale CCS in Saudi Arabia' (5 August 2015) <<https://www.globalccsinstitute.com/news/institute-updates/large-scale-ccs-saudi-arabia>>.

<sup>81</sup> John Wilkinson and Selena Herrera, 'Biofuels in Brazil: Debates and Impacts' (2010) 37 *The Journal of Peasant Studies* 749; Petrobras, 'Biofuel Production' (n.d.) <<http://www.petrobras.com.br/en/our-activities/performance-areas/biofuel-production/>>.

<sup>82</sup> Sinopec, 'Fighting Against Climate Change' <<http://www.sinopecgroup.com/group/en/socialresponsibility/Green/facc.shtml>>; PetroChina, *2014 Sustainability Report* (2015) <<http://www.petrochina.com.cn/petrochina/xhtml/images/shyhj/2014kcxzbggen.pdf>>.

<sup>83</sup> These are Datang, Guodian, Huadian, Huaneng, and China Power investment Bergsager and Korppoo (n 59) 40-47.

<sup>84</sup> Xiaolei Sun and others, 'China's Sovereign Wealth Fund Investments in Overseas Energy: The Energy Security Perspective' (2014) 65 *Energy Policy* 654.

<sup>85</sup> S Pulver, 'Climate Change Politics in Mexico' in H Selin and SD van Deveer (eds), *Changing Climates in North American Politics: Institutions, Policymaking, and Multilevel Governance* (MIT Press 2009) 39.

<sup>86</sup> Michael Berry, 'Solid Energy "Wasted Millions"' (31 August 2012) (*Stuff*, 2012) <<http://www.stuff.co.nz/business/industries/7583901/Solid-Energy-wasted-millions>>.

quo and resist to any reform suggested by their owner government.<sup>87</sup> A constructive relation of trust between the SOE and its owner government conditions the success of State ownership policies on climate change mitigation. When States are actually at the command, however, State ownership can be a great opportunity, too long neglected, to rapidly trigger profound transformations towards a more sustainable development model. Active, climate-sensitive State ownership policies may have enough leverage to overcome the ‘carbon curse’.

## V. Conclusion

State ownership policies have great potential as an entry point for rapidly triggering efforts towards climate change mitigation. So far, however, State ownership policies have not fully internalized the potential costs of climate change. On the contrary – and in line with the ‘carbon curse’ hypothesis –, large historical and current greenhouse gas emission traceable to SOEs suggest that State ownership policies have often embodied policy incoherence and carbon intensive practices with little consideration for global environmental externalities.

Against this backdrop, we have drawn attention to policy opportunities that arise when climate sensitive State ownership is viewed from the perspective of active ownership. Ownership policies are bound to become increasingly important in international action on climate change mitigation following the adoption of the Paris Agreement and its increased focus on public/private policy platforms, investment patterns, and the role of State in creating an enabling environment more generally. Moreover, climate-sensitive State ownership builds on and is compatible with the advance of climate finance and movements promoting responsible public investment in general. It is also increasingly embedded in States’ international legal obligations related to climate change, for instance on the phasing out of fossil fuel subsidies.<sup>88</sup> Judged by participation to an industry climate pledge by a number of key SOEs, such as Saudi Aramco, Pemex and CNPC, many SOEs *themselves* recognize the intersection between progressive climate policy, technological development and State ownership.<sup>89</sup>

This is not to say that State ownership policies are a silver bullet solution to climate change mitigation. In many parts of the world, State ownership continues reflect and perpetuate rent seeking, elite expropriation, crony capitalism and geopolitical interests. The corruption scandal centred on Brazilian State-owned oil-company Petrobras serves a useful reminder, as does the utilization of Gazprom and Rosneft as tools for Russian foreign policy. Moreover, active State ownership and State investment are easily politicized, as the reception of Chinese energy investment in Europe has shown.<sup>90</sup>

This notwithstanding, the rise of SOEs and State investment in the global economy suggests that active State ownership provides a promising policy platform in national contexts and sectors where market-based mitigation mechanisms may not yield the same outcomes as in Annex-B Parties. Emerging economies with a strong share of State ownership in the fossil fuel and power sectors are increasingly relying on State ownership to implement their respective mitigation commitments. Recent suggestions to use State investment banks, as well as SWFs, to promote behavioural change in target companies and to foster technological development

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<sup>87</sup> Lisa Williams, ‘China’s Climate Change Policies: Actors and Drivers’ (*Lowy Institute Analysis*, 2014) <<http://www.lowyinstitute.org/files/chinas-climate-change-policies.pdf>>.

<sup>88</sup> ‘G7 Ise-Shima Leaders’ Declaration (7 May 2016)’ (2016) <<http://www.mofa.go.jp/files/000160266.pdf%0A>>.

<sup>89</sup> OGCI, ‘Oil and Gas Climate Initiative’ (2017) <<http://www.oilandgasclimateinitiative.com/about>>.

<sup>90</sup> Tomasz Kamiński, ‘Sovereign Wealth Fund Investments in Europe as an Instrument of Chinese Energy Policy’ (2017) 101 *Energy Policy* 733; Liedtke (n 21).

capable of combating climate change are integral parts of the same conversation.<sup>91</sup> While much of the policy discussion has focused on environmentally-sensitive public procurement,<sup>92</sup> the overall discussion pursued in this article suggest that, ultimately, climate change mitigation efforts need to harness the influence of State shareholders in order to yield effective results.

Two recent developments come as handy illustrations of the inherent potential of State ownership policies as a tool for climate change mitigation. In 2016, Saudi Arabia revealed an ambitious plan for a radical reform of its economy.<sup>93</sup> This included partial privatization of the fully State-owned energy giant Saudi Aramco, where the government would however keep a majority stake. The proceeds would be allocated as seed money for a new SWF, anticipated to be the world's largest, holding up to an average of three percent of every publicly-listed company across the globe.<sup>94</sup> If successful, the restructuring plan will increase the efficiency and diversity of the Saudi economy and unlock funds for State investment into strategic sectors beyond energy. Even though climate change mitigation is not specifically mentioned in the blue prints available to date, environmental sustainability is among the policy objectives that the Saudi government wants to pursue through the use of this fund.<sup>95</sup>

The Saudi plans mirror, to a great extent, Norwegian experiences with the Government Pension Fund Global, currently the world's largest SWF. In recent years, the Norwegian SWF has taken a firm stand on climate change as evidenced by series of divestments from oil and coal companies.<sup>96</sup> From this article's perspective, however, the SFW's active ownership on climate change challenges may well be of more lasting significance. The SWF's requirements for investee companies to integrate climate considerations in their core business models, risk management and reporting underscore the importance of State shareholder engagement in climate change mitigation.<sup>97</sup> Were Saudi Arabia genuinely to adopt a role similar to what Norway has been pursuing in its active ownership policies through Statoil and SWF investments, breaking the global carbon curse would appear a real possibility both nationally and internationally.

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<sup>91</sup> Reiche (n 12); Mariana Mazzucato and Caetano Penna, 'The Rise of Mission-Oriented State Investment Banks: The Cases of Germany's KfW and Brazil's BNDES' (2015) <[http://www.isigrowth.eu/wp-content/uploads/2015/11/working\\_paper\\_2015\\_1.pdf](http://www.isigrowth.eu/wp-content/uploads/2015/11/working_paper_2015_1.pdf)>.

<sup>92</sup> See e.g. Chonnikarn Jira and Michael Toffel, 'Engaging Supply Chains in Climate Change' (2013) 15 *Manufacturing & Service Operations Management* 559; Beate Sjøfjell, 'Sustainable Public Procurement as a Driver for Sustainable Companies?' in Anja Wiesbrock and Beate Sjøfjell (eds), *Sustainable Public Procurement under EU Law: New Perspectives on the State as Stakeholder* (Cambridge University Press 2015); and Alessandro Cerutti and others, 'Carbon Footprint in Green Public Procurement: Policy Evaluation from a Case Study in the Food Sector' (2016) 58 *Food Policy* 82.

<sup>93</sup> Kingdom of Saudi Arabia, 'Vision 2030' (2016) <<http://vision2030.gov.sa/download/file/fid/417%0D>>.

<sup>94</sup> Financial Times Alphaville, 'The Prince, the Firm, and the Fund' *FT* (26 April 2016) <<http://ftalphaville.ft.com/2016/04/26/2160208/the-prince-the-firm-and-the-fund/>>.

<sup>95</sup> Kingdom of Saudi Arabia (n 93) 23.

<sup>96</sup> For most recent exclusions, see Norges Bank Investment Management, 'Grounds for decision – Product based coal exclusions (7 March 2017)' (2017) <<https://www.nbim.no/contentassets/08b0787eae8a4016bd06bfeba0067e32/third-tranche-of-coal-exclusions---grounds-for-decision.pdf>>.

<sup>97</sup> Norges Bank Investment Management (n 63).