Linking executive compensation to climate performance

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Abstract
Climate change and wider environmental, social and governance (ESG) issues have risen to board-level on the corporate agenda. Under pressure from institutional investors, companies are reformulating their strategies for a climate-constrained world. A novel aspect of the emerging corporate response is that executive compensation is being linked to climate performance. At the largest European energy companies, climate metrics now make up 11% of CEO bonus plans while ESG metrics account for 25%. This paper explains the case for corporate climate action, and presents a framework for companies to understand the design options and challenges in using climate-linked management incentives.

Keywords: Balanced scorecard, corporate climate action, corporate strategy, ESG, executive compensation, management incentives

JEL codes: L21 (firm objectives), M12 (executive compensation), Q54 (climate change)

1. Introduction
With the 2015 Paris Agreement to limit global warming to well below 2 degrees, climate change has moved back up the policy agenda. Governments around the world are developing policies to help achieve global climate targets. At the same time, climate change—and wider environmental, social and governance (ESG) issues—have risen to board-level on the corporate agenda. Across the corporate sector, companies are reformulating their strategies for a climate-constrained world—and there is growing appetite for experimentation with low-carbon products and business models.

Pressure from institutional investors is an important driver of this process. Back in 2015, Mark Carney, as Governor of the Bank of England, warned the financial community about the implications of climate change for the value of investment portfolios. Over the last 2 years, investors have mounted increasing pressure on listed companies to measure and disclose their exposure to climate change—and to formulate corporate strategies that are “Paris-aligned”. A central role is played by investor coalitions like Climate Action 100+, a group with over $40 trillion in assets.

1 I am grateful to Simon Dietz, Felix Grey, Jennifer Howard-Grenville, Thomas Kansy, Kevin Massy, Julian Metherell, David Pitt-Watson and David Reiner for helpful comments and discussion and to Olivia Chen for excellent research assistance. All views expressed and any errors are my own. Author contact: r.ritz@jbs.cam.ac.uk

under management. Closely related, the Task Force on Climate-Related Financial Disclosures (TFCD) has developed a set of principles for the voluntary corporate disclosure of climate risks. Companies ranging from BP and Shell to Duke Energy to Nestlé to American Airlines have set targets for “net zero” emissions. Unlike national climate policy initiatives, investor-driven corporate climate action has global reach.

A novel aspect of the emerging corporate response is that executive compensation is starting to be aligned with climate performance. In December 2018, Shell announced that it will from 2020 onwards tie the incentive pay of its CEO and senior management to company-wide carbon targets. During 2019, several other major oil & gas companies, including BP and Chevron, under shareholder pressure resolved to incorporate carbon targets into executive pay. BHP, one of the world’s largest miners, also uses a climate target in its CEO pay; electricity companies are exploring similar ideas. Companies in other sectors like heavy industry and transport—including airlines, aluminium, cement, and steel—face similar questions of how to deliver on pledges to cut carbon. In short, carbon emissions are emerging as an important driver of long-term corporate value—and companies are beginning to embed them in their management incentives as a key performance indicator.

This paper addresses the “what, why, and how?” of linking executive pay to climate metrics. As a business practice, this raises important questions that straddle environmental concerns and corporate governance—the ‘E’ and the ‘G’ in ESG. Section 2 explains the rationale for corporate climate action to fill the gap left by government-led climate policy. Section 3 presents an overview of the use of climate-linked metrics in CEO incentive plans at five of the world’s largest energy companies (BP, Chevron, ExxonMobil, Shell, Total) and a case study of the key design choices at Shell. At the three European players, on average, climate metrics now make up 11% of CEO bonus plans while ESG metrics overall account for 25%, alongside traditional financial and operating metrics. Section 4 develops a set of principles through which to understand the benefits of including climate metrics in a balanced scorecard and the challenges in terms of incentive design. Section 5 concludes with recommendations on how the practice of linking executive pay to climate metrics might be refined over time.

2. Why corporate climate action?

Start with a benchmark in which corporate climate action is not needed. The most cost-efficient climate policy has governments put a price on carbon emissions so as to reflect—and thus mitigate—damages to the planet. Given the global nature of climate change, the carbon price should be global, covering all countries and all sectors of the economy. Carbon pricing induces companies to factor climate change into their

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4 Net zero involves a company reducing its carbon emissions to a point where it matches any remaining emissions with a negative-emissions sink (e.g. forestry or carbon capture) so the net effect is climate-neutral.

5 A number of important issues are beyond the scope of this paper. This includes the proper level of executive pay as well as design aspects such as vesting schedules and clawback rules. This paper focuses on whether climate metrics should have a non-zero weight in incentive pay. It also does not deal explicitly with reputational and other non-monetary incentives related to climate change.

6 For another exposition of the ideal of a global carbon price, see Chapter 8 of Jean Tirole (2017). Economics for the Common Good. Princeton, NJ: Princeton University Press. Its intellectual antecedents date back 100 years to
decision-making so it will be reflected in the prices of their products, in their profits—and hence also in their stock prices. This climate-policy design aligns the private interests of individual actors in the economy with wider social interests; there is no need for voluntary corporate climate action beyond simply responding to market signals. Suitable incentives for management can be provided by linking executive pay to the company’s stock price; there is no point in using additional performance metrics—be it financial metrics or non-financial metrics related to ESG.

There are two further implications for climate targets at the corporate level. First, while emissions need to be correctly measured along the value chain to properly implement the global carbon price, there is no need for company-specific or product-specific emissions limits—by reducing flexibility, these would just drive up the overall cost of abatement. Second, the global carbon price sidesteps any need to distinguish between Scope 1 emissions from a firm’s own production and Scope 3 emissions that include those arising along its value chain. As every entity across the global economy is covered, a firm’s customers and its suppliers also face a carbon price on the emissions they generate and factor this into their own demand and supply decisions.

This line of argument, turned on its head, suggests corporate climate action can be warranted due to a gap in terms of government-led climate policies. The Carbon Pricing Leadership Coalition has estimated that the ambitions of the 2015 Paris Agreement would require a global carbon price of at least $40-80 per ton of CO₂ in 2020, rising to $50-100/tCO₂ by 2030. While governments around the world have introduced a wide array of climate commitments, carbon pricing currently covers only 20% of global emissions, with an average price far less than $10/tCO₂. Only very few sectors—notably European power generators like Enel, Engie, and Iberdrola that are subject to an auction-based price of around $30/tCO₂ in the European Union’s emissions trading system—face a carbon price anywhere near required levels.

Against the backdrop of this policy gap, institutional investors are asking the corporate sector to take on a leadership role in the low-carbon transition—and on wider ESG issues. Over the last five years, investors have collectively come to the realization that climate change puts at risk the value of their portfolios. The implication is that, if the Paris climate target is to be achieved, stakeholders other than governments need to step in. As a result, there is a move away from the idea of a global carbon price towards granular firm-specific emissions trajectories embedded in carbon-reduction targets at the corporate level. Underlying this is a heightened fear that the world is approaching a tipping point in terms of the damages due to climate change.

At the same time, there is mounting evidence—and investor belief—that companies with better ESG performance also do better in the stock market. The traditional economics argument is that ESG-related activities cannot be value-enhancing as they divert resources from direct productively activities; they might nonetheless be

pursued because they benefit the reputation of the firm’s management. Yet, over the last 20 years, a number of studies have found that companies with better ESG metrics, for example, on employee satisfaction, also have superior stock-market performance. In short, there is a growing belief amongst companies and investors that making money and “doing good” can go hand-in-hand.

Alongside this increased demand for corporate climate action, it has also become much cheaper for companies to supply emissions reductions. Traditional economic thinking is centered around the notion that cutting carbon is costly for firms; in the absence of government regulation, the corporate sector does not have a strong incentive to go green. Yet the last decade has seen declines of around 80% in the costs of renewable energy from solar and wind as well as in facilitating technologies like battery energy storage. For heavy consumers of electricity, renewable power purchase agreements (PPAs) are now often cheaper than legacy fossil-based power sourcing; Google, for instance, in 2017 chose to switch to 100% renewable energy. For industrial sectors, investing in low-carbon technologies has become much more financially attractive, and evolving societal preferences mean that customers are increasingly willing to pay extra for greener products. As a result, the traditional trade-off between emissions cuts and firm value is relaxed. Indeed, for new entrants with a green business model or a polluting firm whose production is significantly cleaner than its rivals’, the trade-off is reversed: tighter carbon regulation is positive for firm value.

3. Climate-linked incentives in executive compensation

Climate-linked incentive pay at the energy majors

Given its public visibility and carbon-intensive ways, the energy industry has been at the forefront of ESG-related pressure from institutional investors—and executive pay linked to climate targets is now emerging as a business practice at some of the world’s largest corporations. Figure 1 presents a high-level overview of 2019 CEO remuneration plans at five of the largest oil & gas companies—BP, Chevron, ExxonMobil, Shell, and Total. It distinguishes between two types of incentive pay: the short-term incentive plan (STIP) underlying annual bonus payments and the long-term incentive plan (LTIP) typically paid out as stock-based compensation. Despite

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11 Investment portfolios that screen holdings on socially responsible investment (SRI) criteria can outperform. It is possible to construct portfolios that match the overall expected risk-return profile of traditional stock indices but with 50% less expected exposure to climate-related risks—together with a free option on outperformance when climate policy tightens. See Mats Andersson, Patrick Bolton, and Frédéric Samama (2016). Hedging Climate Risk. *Financial Analysts Journal* 72(3), 13–32.

12 See Lazard (2020). Levelized Cost of Energy Analysis—Version 14.0, October 2020. Early policy support for roll-outs of renewable power, notably in Germany and China, has had large spillover benefits for the rest of the world. The large costs borne by German consumers are now water under the bridge but have fundamentally altered the forward-looking abatement calculus for everyone else.

13 Figure 1 is based on CEO incentive plans that started in 2019 and pay out in future years according to company-specific vesting periods; other incentive plans pay out in 2019 but commenced in previous years.
their superficial similarities as global energy businesses, there is large variation in compensation practices across these companies.

Traditional financial metrics dominate short-term and, especially, long-term incentives. All companies use total shareholder return (TSR) as a key performance indicator in their LTIPs; its weight, however, varies widely from 100% at Chevron, over an undisclosed weighting at ExxonMobil, to 22.5% at Shell. All companies employ relative performance evaluation against a peer group, notably on TSR. On average, financial metrics like TSR and return on average capital employed (ROACE) account for 62% in STIPs and 90% across the companies’ LTIPs. Non-financial metrics also play an important role; an ESG metric, here labelled “Health & Safety”, has a long standing in the energy industry to measure safety events and employee injuries. This metric is used by all companies as part of STIPs (except at ExxonMobil) with weights as high as 20% at BP. Finally, all companies except Chevron employ a “strategic objectives” metric that captures CEO milestones on the implementation of corporate strategy.

Against this background, all five companies employ CEO incentives that are, in quite different ways, linked to climate metrics. For short-term incentives, all except ExxonMobil use a metric related to the reduction of greenhouse gas (GHG) emissions, with weights up to 10%. At Shell, this is the carbon emissions intensity of its upstream, refining, chemicals, and integrated natural gas business units. ExxonMobil is the only company with short-term pay based solely on financial performance; Total is the only company with explicitly-labelled performance measure on corporate social responsibility (including its climate performance, with 8% weight in its STIP). Climate-related metrics make up 8% of CEO bonus pay plans on average across the five companies and 11% at the three European companies.

Long-term CEO incentives linked to climate are employed at BP, ExxonMobil and Shell. BP and Shell do this by way of “strategic objectives”. At BP, this includes venturing into low-carbon businesses and growth in its power and renewables businesses; Shell has a dedicated energy transition metric that features a reduction target for its life-cycle emissions (net carbon footprint). Unlike others, ExxonMobil features the reduction of methane emissions as a strategic objective in its LTIP. At the opposite end, Chevron and Total link long-term incentives solely to financial performance, and Chevron exclusively relies on TSR. On average, climate-related metrics make up 4% of long-term incentive pay.\(^\text{14}\)

The divergence between European and US companies is evident. European players, notably BP and Shell, use broad climate-linked incentives that relate to corporate strategy, for example, growing their low-carbon businesses and reducing company-wide emissions reductions. By contrast, Chevron and ExxonMobil employ narrow climate-linked incentives related to emissions reductions of individual business units, with a focus on methane. More broadly, ESG metrics—including both climate- and safety-related metrics—make up an average of 18% (STIP) and 10% (LTIP) of incentive pay across the five companies against 25% (STIP) and 13% (LTIP) only for the European players. Overall, this picture is consistent with European oil & gas majors embracing the energy transition more strongly than their US peers—so far. Over time, the introduction of climate-linked incentives has displaced financial metrics. For example, in their 2019 LTIPs, both BP and Shell reduced weights placed on ROACE and other financials to accommodate their strategic climate objective; in Total’s 2019 STIP, the weight on the debt-to-equity ratio was cut.

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the weight placed on climate metrics may further increase and the practice may be adopted by smaller companies—and even by the large state-controlled players.15

<table>
<thead>
<tr>
<th></th>
<th>Short-term incentive plan (STIP)</th>
<th>Long-term incentive plan (LTIP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BP</strong></td>
<td>Financial performance (50%)</td>
<td>Financial performance (70%)</td>
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<tr>
<td></td>
<td>- Operating cash flow (20%)</td>
<td>- TSR (relative to peers) (50%)</td>
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<td></td>
<td>- Replacement cost profit (20%)</td>
<td>- ROACE (20%)</td>
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<td></td>
<td>- Upstream unit production costs (10%)</td>
<td>Strategic objectives (30%)</td>
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<td></td>
<td>Operating performance (20%)</td>
<td>- Upstream shift to gas and advantaged oil</td>
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<td></td>
<td>Health &amp; Safety (20%)</td>
<td>- Downstream market-led growth</td>
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<td></td>
<td>Environment (10%)</td>
<td>- Low-carbon venturing</td>
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<td></td>
<td>- Sustainable emissions reduction (10%)</td>
<td>- Growth in gas, power and renewables</td>
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<tr>
<td><strong>Chevron</strong></td>
<td>Financial performance (70%)</td>
<td>Financial performance (100%)</td>
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<td></td>
<td>- Earnings per share, net cash flow and other metrics (40%)</td>
<td>- TSR (absolute &amp; relative to peers)</td>
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<tr>
<td></td>
<td>- ROACE and other metrics (30%)</td>
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<tr>
<td></td>
<td>Operating performance (15%)</td>
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<td></td>
<td>- Production volume and other metrics</td>
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<td></td>
<td>Health &amp; Safety, and Environment (15%)</td>
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<tr>
<td></td>
<td>- Safety metrics</td>
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<tr>
<td></td>
<td>- Methane emissions intensity</td>
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<tr>
<td><strong>ExxonMobil</strong></td>
<td>Financial performance</td>
<td>Financial performance</td>
</tr>
<tr>
<td></td>
<td>- Annual earnings</td>
<td>- TSR (absolute &amp; relative to peers)</td>
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<td></td>
<td>- Earnings per share</td>
<td>- ROACE (absolute &amp; relative to peers)</td>
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<td></td>
<td></td>
<td>- Cash flow from operating activities (absolute &amp; relative to peers)</td>
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<tr>
<td><strong>Shell</strong></td>
<td>Financial performance (30%)</td>
<td>Financial performance (90%)</td>
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<td></td>
<td>- Cash flow from operating activities (30%)</td>
<td>- TSR (relative to peers) (22.5%)</td>
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<td></td>
<td>Operating performance (50%)</td>
<td>- ROACE growth (relative to peers) (22.5%)</td>
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<td></td>
<td>- Production volume and other metrics</td>
<td>- Free cash flow (22.5%)</td>
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<td></td>
<td>Sustainable development (20%)</td>
<td>- Cash flow from operations growth (relative to peers) (22.5%)</td>
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<td></td>
<td>- Health &amp; safety (10%)</td>
<td>Energy transition (10%)</td>
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<td></td>
<td>- GHG emissions intensities (10%)</td>
<td>- Reduction in net carbon footprint</td>
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<td></td>
<td></td>
<td>- Growing power business</td>
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<td></td>
<td></td>
<td>- Advanced biofuels technology and CCUS</td>
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<tr>
<td><strong>Total</strong></td>
<td>Financial performance (62%)</td>
<td>Financial performance (100%)</td>
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<tr>
<td></td>
<td>- Net debt-to-equity ratio (17%)</td>
<td>- TSR (relative to peers) (33.3%)</td>
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<td></td>
<td>- Return on equity (17%)</td>
<td>- Net cash flow per share (33.3%)</td>
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<tr>
<td></td>
<td>- Pre-dividend organic cash breakeven (17%)</td>
<td>- Pre-dividend organic cash breakeven (33.3%)</td>
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<tr>
<td></td>
<td>- ROACE (relative to peers) (11%)</td>
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<tr>
<td></td>
<td>Health &amp; Safety, and Environment (16%)</td>
<td></td>
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<tr>
<td></td>
<td>- Safety metrics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- GHG emissions (6%)</td>
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<tr>
<td></td>
<td>Strategic objectives (22%)</td>
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<tr>
<td></td>
<td>- Negotiations with producing countries (8%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Growth in gas, power and renewables (6%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Corporate social responsibility, including climate performance (8%)</td>
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</tbody>
</table>

**Figure 1:** Performance metrics used in 2019 CEO incentive plans

_Notes: Author discretion applied in categorizing metrics. ExxonMobil does not disclose individual weights. Total's weights renormalized to sum to 100%. Climate-linked metrics shown in green._16

15 BP’s 2020 CEO incentive plan increased “sustainable emissions reduction” from 10% to 20% of the STIP.
16 Sources: BP Annual Reports 2018 and 2019; Chevron Corporate Responsibility Report 2018; Chevron Proxy Statement 2020; Exxon Proxy Statement 2020, Exxon Energy and Carbon Summary 2019 and 2020; Shell
Designing climate-linked incentives: The case of Shell

The case of Shell illustrates the details of designing incentive pay linked to climate ambition. Among the large oil & gas companies, Shell has been a leader in beginning to re-shape its corporate strategy for a low-carbon world, and is explicit about its ambitions to “thrive in the energy transition” and “sustain a strong societal license to operate”. On the climate front, this includes long-term goals of reducing the net carbon footprint of its business, and, as of April 2020, a “net zero” target for 2050 oil & gas production.17 As seen, Shell is currently unique among the energy majors with climate-linked metrics representing 10% of both its CEO short- and long-term incentive plans.

Figure 2 synthesizes Shell’s two climate-linked performance metrics around a framework of key questions, categorized into the metrics’ climate design and pay design. The metric used in Shell’s STIP is based on reductions in the emissions

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17 In April 2020, at the height of the Covid-19 crisis, Shell introduced a net zero emissions target for Scope 1 emissions from oil & gas production by 2050 as well as tighter targets for its overall net carbon footprint of a 30% cut by 2035 (replacing 20%) and a 65% cut by 2050 (replacing 50%). See Financial Times (2020). Shell steps up climate goals despite twin crisis. 16 April 2020.

intensities of several business units: refining, chemicals, upstream and integrated gas. In terms of climate design, it is an emissions target—albeit framed in terms of emissions intensity rather than the absolute level of emissions—that covers Scope 1 (direct production) and Scope 2 (purchased electricity) emissions. Targets based on emissions intensities are often seen critically by environmentalists as they do not rule out increases in the absolute level of emissions due to production growth. In terms of incentive design, the metric is based on Shell’s own performance—rather than its relative performance compared to a peer group; incentive payments accrue incrementally with reductions in emissions intensities (rather than only once when a threshold value is reached).

The “energy transition” metric used in Shell’s LTIP differs from this in several design elements. It combines a company-wide long-term goals for absolute emissions reductions to 2030 and 2050 with strategic objectives for the growth of new low-carbon businesses and technologies in power, advanced biofuels and carbon capture systems (CCUS). In this sense, it features both lagging and leading climate indicators. The emissions-reduction goals are measured in terms of “net carbon footprint” (including Scope 3). These metrics are also based on Shell’s own performance but leave a degree of discretion to its remuneration committee around the thresholds at which additional incentive pay occurs and around the breakdown of the 10% scorecard weighting into its four components. Shell’s remuneration committee can decide to allocate greater emphasis to the carbon footprint metric, and expects the weighting on the energy-transition metric to increase over time and. In sum, the long-term climate incentive is significantly broader and more explicitly quantified in its ambition.

4. Designing climate-linked incentives: Principles, benefits, and challenges

Principles for incentive design

Incentive programs for top management are a key ingredient of corporate governance, and at major corporations are often centered around stock-based compensation to help align the interests of shareholders and managers. Incentives are a powerful tool, compelling in theory but hard to get right in practice; the history of organizations is littered with examples of well-intentioned incentive programs that turned out to be dysfunctional. These often involve managers being able to game the performance measure (e.g. using accounting tricks) or being inadvertently incentivized to pursue a different goal from what is good for the firm (e.g. pumping short-term results at the expense of long-term value).

A large literature on the economics of incentives provides guidance on the design of executive pay: which performance metrics to use and how to combine them. This

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19 These emissions range from the upstream purchase of goods and services (including transportation) to the downstream consumer use and afterlife of products.

20 The same 10% weighting in long-term incentive pay on the energy transition metric was in 2019 applied to around 150 senior managers at Shell, and is expected to broaden to 16,500 employees during 2020.


22 Recent overviews of this literature include Alex Edmans and Xavier Gabaix (2016). Executive Compensation: A Modern Primer, Journal of Economic Literature 54(4), 1232–1287 and Bengt Holmström (2017). Pay for Performance and Beyond, American Economic Review 107(7), 1753–1777. At the heart of the incentive problem between the “principal” (shareholders, represented by the board of directors) and the “agent” (senior management) lies an information asymmetry: the board is imperfectly informed about the details and value of
literature can be distilled into four high-level principles that are particularly useful for thinking about the “why?” and “how?” of linking management incentives to a company’s climate performance:

**Principle 1: Align executive pay with corporate strategy and long-term value**

Executive pay should be aligned with corporate strategy which in turn should aim at value creation over the long term. This is traditionally associated with total shareholder return (TSR). Since the Global Financial Crisis in the late 2000s, long-term value creation for many sectors is increasingly tied to government regulation.

**Principle 2: Optimize the overall risk-reward profile of executive pay**

The intensity of incentives—the fraction of executive pay that is linked to performance—needs to strike a balance between risk and return. Few people are willing to work for a zero salary with their income potentially entirely dependent on the vagaries of the stock market; a fixed salary alone provides no incentive to go the extra mile nor any indication of how to prioritize between different courses of action.

**Principle 3: Use actionable performance metrics that reflect management value-added**

Additional performance measures—alongside those tied to the stock price—can be useful insofar as they contain information about a company’s long-term prospects that is not fully captured by the stock price. These performance measures should, in addition, be actionable in that top management can influence them.

**Principle 4: Balance incentives across multiple tasks and proximate objectives**

In the presence of multiple—and perhaps competing—proximate objectives, it is desirable for management incentives to be well-balanced across different tasks. Otherwise the danger is excessive focus on a subset of tasks at the expense of everything else.

The design of incentives linked to climate performance begins with accurate information on a company’s carbon emissions. Widely-used financial metrics like ROACE are produced during the normal course of business; increasingly, this also includes carbon emissions. Regulation has made many companies invest in accurate emissions measurement; for the purpose of providing management incentives, this now comes at zero incremental cost. Some companies are also providing voluntary disclosure of their carbon emissions to investors. Accurate measurement helps to create an actionable performance measure (Principle 3). A caveat is that this has so far focused on emissions from a company’s own operations (Scope 1); the measurement of emissions along the value chain (Scope 3) is less well-developed.

Given that a firm’s carbon emissions are being adequately measured, should they be part of an incentive program? For the benchmark with efficient climate policy (and management’s actions. Were the board perfectly informed, it could “force” optimal behavior with an algorithm that specifies the desired course of action for management in each possible state of the world. Then it would be sufficient to pay the CEO a fixed wage—along with sending an infinitely detailed letter of instructions. With information asymmetries, an incentive package becomes a valuable tool to guide and motivate management—even if the alignment with shareholders’ interests will never be perfect.

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otherwise efficient markets), the answer is no: all relevant information about the quality of management and the long-term value of the firm is already captured in the stock price. Executive pay linked to climate targets can only lead to value-reducing distortions further down the road. However, moving beyond this simple benchmark, incentives linked to climate performance can become useful.

**Strategic considerations**

An increasing number of carbon-intensive companies are reaching the diagnosis that their long-term value depends on cutting emissions. Corporate strategies are being reformulated for a climate-constrained world and big changes to business models will be needed. Corporate transformation comes in two main parts: the first is reducing emissions of existing high-carbon business units; the second is growing new low-carbon businesses, products, and technologies. In many cases, therefore, carbon-heavy activities will operate side-by-side with more innovative and greener initiatives. A similar challenge exists across the board for companies that wish to survive the low-carbon transition. In short, climate concerns have become a central aspect of long-term firm value across many sectors, and, by Principle 1, there is a case for reflecting this in management incentives and executive pay.

Many companies use a balanced scorecard to gauge their performance in a holistic fashion; a key aspect of the scorecard is that it often features non-financial metrics—including ESG factors—that capture a company’s proximate objectives. By Principle 3, it makes sense to use such additional performance measures as part of an incentive package to better capture the value-added of top management. One important reason is that stock markets can be overly short-termist so a company may rely on other metrics to provide a longer-term perspective on its performance. This is particularly salient for companies with complex strategies and high levels of innovation that the stock market may struggle to understand. It is also an important consideration for those that operate green and less green business units under a single corporate roof. This complexity will need to be reflected in the balanced scorecard, making climate-linked incentives particularly attractive to such companies.

A subtle challenge underlying the use of balanced incentives evolves around potential conflicts between individual performance metrics. A well-known example is that too strong a focus on increasing market share—for example, by way of aggressive product pricing—can come at the expense of profitability and firm value. The traditional concern about ESG metrics is that, while perhaps “nice to have”, they are costly to deliver and it is shareholders who will ultimately pay. Similarly, the easiest way for many companies to reduce their carbon emissions, in the short term, is simply to cut production—which may again stand in direct conflict with firm value. Such conflicts, however, have recently been significantly relaxed. First, many businesses are discovering that cutting carbon—increasingly aided by technologies like artificial intelligence (AI) and machine learning—can go hand-in-hand with cutting costs, for

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24 So far, only few companies have undergone full-scale transformations from “brown” to “green”; a notable example is Ørsted, Denmark’s state-controlled oil & gas company, now one of the world’s largest renewable energy companies. For a contrary view that advocates a “harvest” strategy for oil & gas companies to maximize the remaining value from fossil assets but argues against transformation due to the absence of competitive advantage, see Dieter Helm (2017). Burn Out: The Endgame for Fossil Fuels. Yale University Press.

example, because it reduces waste.\textsuperscript{26} Second, companies are increasingly subject to carbon pricing in the jurisdictions in which they operate; this additionally rewards emissions reduction and helps align it with firm (and social) value. Third, evolving consumer preferences and rapid progress in clean technologies have already relaxed this trade-off; over the longer haul, low-carbon innovation can facilitate higher sales for a given climate target. Fourth, even if the trade-off still exists in the short run, it may vanish over the longer run—especially if a business runs the risk of losing its social license to operate.

Many carbon-intensive companies sell into commodity markets—such as oil, natural gas, iron ore, and steel—that are susceptible to boom-bust swings in prices and profits. Likewise, their corporate mindset also swings back-and-forth between a focus on growth and a focus on profitability. This is reflected in balanced scorecards: metrics like production targets and market share are the “growth mode” while others like ROACE are the “profitability mode”. A greater sectoral focus on climate targets may impart greater discipline in capital allocation, favouring profits over growth. The last barrel of oil extracted looks less attractive and growth by way of investment in high-cost projects—often also environmentally more suspect—looks slightly less good. Including climate-linked incentives in executive pay cannot solve the underlying problem but may provide a nudge towards value over volume.

\textit{Incentive considerations}

Management incentives linked to climate metrics can be formulated in different ways, as illustrated by Figure 2. First, they can be narrow, pertaining only to individual business unit(s), or broad, covering the whole company. Second, they can be formulated directly in terms of carbon emissions or indirectly in terms of the growth of low-carbon businesses, products, and technologies. Third, emissions targets can be designed as a reduction in the absolute level of emissions or as a reduction in emissions intensity of a product or business. The most ambitious and environmentally-definitive combination—a broad company-wide climate target for the level of emissions—will be most attractive for companies seeking to align their strategies with the 2015 Paris Agreement. This climate metric, in turn, should be particularly suitable for inclusion in a long-term incentive plan.

An important lesson from the history of incentive design is that the use of “non-linear” performance targets can distort incentives. Consider a sales target under which a manager receives a fixed bonus if the threshold is met at year-end and gets no bonus otherwise. Incentives are very weak if the target looks unattainable, very strong when the target is almost reached, and zero if the sales target is locked in before the year is over. This volatility in the return to managerial effort is unlikely to be well-aligned with value creation, especially Principles 1 and 2. Moving the goal posts around once the target has been met does not help either, as any anticipation of this by managers would undermine the credibility of the incentive program in the first place. Therefore, a linear incentive scheme that offers continuous rewards for extra performance is

\textsuperscript{26} This raises a deeper question: if the measurement of carbon emissions is useful in designing management incentives, then why did firms not always measure them? One response is that this is \textit{prima facie} evidence of non-maximizing behaviour by firms. Another response is that setting up measurement systems is costly and may be worth doing only given a regulatory requirement. See Geoffrey Heal (2008). \textit{When Principles Pay: Corporate Social Responsibility and the Bottom Line}. New York: Columbia University Press for related discussion.
usually a better choice. Applied to climate-linked incentives, this argues for payments to be linked to continual emissions reductions rather than binary targets.

Tying climate-linked incentives to a company’s value-chain emissions is puzzling in that it seems to contradict Principles 2 and 3. Scope 3 emissions are (a) difficult to measure correctly and (b) significantly beyond management control. This suggests that including them in executive pay is likely to be counterproductive: they blur the signals about management’s performance and expose executives to uncontrollable risks. Through this perspective, basing incentives on Scope 1 emissions from own production has greater appeal. Granted, over time, management may switch to cleaner suppliers and find ways to help customers reduce emissions arising from product use. Instituting climate-linked incentives based on Scope 3 emissions also raises the return to measuring them correctly in the first place. All the same, it is worth bearing in mind that the recent corporate history of measuring consumer emissions is not a happy one, as illustrated by the Volkswagen “Dieselgate” scandal. In the climate-policy arena, Scope 3 emissions are the direction of travel but there may a rocky road ahead.

At the same time, climate-linked incentives based on value chain emissions can help align with a more climate-ambitious corporate strategy. In May 2019, Shell sold two carbon-neutral cargos of liquefied natural gas (LNG) to Japanese buyers, Tokyo Gas and GS Energy, for which the carbon-intensity of the natural gas was offset by bundling the sale with carbon credits from Shell’s portfolio of “nature-based solutions”: forestry assets that act as carbon sinks with negative emissions. This is an initial example of how a strategic focus on life-cycle emissions creates a product that is valued by greening customers and may constitute a first-mover advantage over competitors. Incentive considerations point to the risks inherent in basing executive pay on supply chain emissions. Yet this example suggests that strategic considerations may increasingly point to a focus on Scope 3 emissions—especially as emissions measurement improves across the value chain.

Executive compensation can also become susceptible to concerns about “paying for luck”. There is significant evidence that incentive pay appears to reward top managers simply for being lucky. For example, the profitability of many energy companies varies strongly with the price of crude oil—which is essentially beyond management control. Nonetheless, the evidence is that energy CEOs are paid systematically more when the oil price happens to be high. This transfers wealth from shareholders to management—and is sometimes interpreted as evidence of excessive value extraction by CEOs. In a similar way, linking incentives to a company’s climate performance raises the prospect of pay for luck. If global climate policy turns out to be tighter than expected, this will push down corporate emissions without necessarily being evidence of management performance. If climate incentives are linked to Scope 3 emissions, things become even more complex: should a CEO get a bigger bonus if one of the company’s suppliers finds a lower-carbon way of delivering its product?

27 There are wider concerns about double-counting: the Scope 3 emissions of one firm may be the Scope 1 emissions of another. But this seems tangential to the provision of incentives by an individual firm.
To sidestep such concerns, executive pay can instead be based on a company’s relative performance. The volatility of commodity prices, for example, creates obvious challenges: an outstanding management effort may look mediocre because of a crash in the oil price while a price spike can make average effort look brilliant. These fluctuations obscure management effort and expose executives to uncontrollable risks. The principles of incentive design suggest that it is preferable for such “noise” to be filtered out by using measures of a company’s relative performance. One option is to compute a normalized profitability metric that tries to filter out the impact of the oil price. Another option is to base incentive pay on the firm’s performance relative to a peer group of comparable companies. Indeed, this is common practice for traditional performance metrics; for example, in determining executive pay, a company’s TSR is often compared to that of a peer group. In a similar way, climate-linked incentives could be based on a company’s emissions reductions relative to its peers. An immediate concern is that this requires confidence that peers’ emissions are accurately measured and are indeed sufficiently comparable (for example, in terms of the scope of emissions). However, as emissions measurement improves over time and the practice of climate-linked incentives becomes more widespread, the opportunities for relative performance evaluation should be enhanced.

Finally, instituting climate-linked incentives can, over time, affect the “match” between a firm and its employees. In the short term, using climate targets as a performance measure will affect the decision-making of existing management. Over time, a greener incentive scheme may affect which “old” employees are retained—and also which “new” employees join the firm. So providing incentives linked to climate targets may be a two-way process: they strengthen the match between the firm and its future workforce—and this, in turn, makes the incentive scheme itself more effective.\(^\text{29}\) This effect is especially salient for an incentive scheme that affects a large fraction of a company’s workforce, not just senior management. It can signal commitment to a new climate-friendly corporate strategy and thereby encourage employees to pursue innovation and invest in firm-specific human capital that is consistent with the new strategy. More broadly, changes in the incentive structure can help reinforce the evolution to a new corporate culture, especially if prospective employees have greener preferences than previous generations.

5. Conclusion

Executive compensation linked to company-level climate performance is emerging as a novel aspect of the corporate response to the low-carbon transition and ESG-driven pressure from institutional investors. While the energy industry has been at the forefront of this investor pressure, companies across virtually all sectors of the economy are pledging to reduce their carbon emissions and over the longer haul aim for “net zero” climate-neutrality. Now these companies need to identify and implement business models and organizational tools to deliver on these climate commitments. In a way that would have seemed surprising even 5 years ago, carbon emissions are emerging as a key performance indicator and the financial sector may turn out to be a major force in solving the climate problem.

Climate-linked incentives can be useful in several ways to businesses that have realized that their long-term value is tied to their climate performance. They can strengthen the alignment between high-level corporate strategy and management incentives in the organization. In this process, they help institutionalize that attention is paid at board-level to the climate implications of business decisions. As part of a company’s balanced scorecard, they can increase the weight attached to non-financial ESG metrics, and thereby provide a constructive signal to institutional investors—and to potential employees—about the future of the business.

So far, the use of climate-linked incentives involves a degree of experimentation, and there will be scope for refinement over time. This is good business practice: see what works and then make adjustments so as to avoid unintended consequences. A central challenge is whether to design incentives based on emissions from own production or to include the supply chain; incentive considerations point to the former while strategic considerations increasingly favour the latter. Over time, as emissions measurement improves across the value chain, “holistic” climate incentives will become more attractive. Unlike traditional metrics like TSR, climate-linked incentives in the energy industry so far do not include evaluation against a peer group. As the practice becomes more widespread, the scope for relative performance evaluation will increase—to better reflect management contribution rather than “pay for luck”.

Linking top management incentives to climate targets should be particularly attractive to emissions-intensive companies that wish to transform their businesses to survive the low-carbon transition. Such companies will need to be ambidextrous: on one hand, re-optimizing legacy businesses to extract their remaining value and, on the other, investing in new low-carbon products and technologies for future growth. Capital allocation between green and less green businesses can be guided by linking management incentives to climate targets—alongside other organizational tools like the use of internal carbon pricing. The experience of the oil & gas sector may offer a useful roadmap of how this challenge can be managed in terms of incentive design.