SUSTAINALYTICS
Thematic Research

10 for 2016

The Paris Agreement: Triumph of the Optimists

Doug Morrow, Madere Olivar & Hendrik Garz
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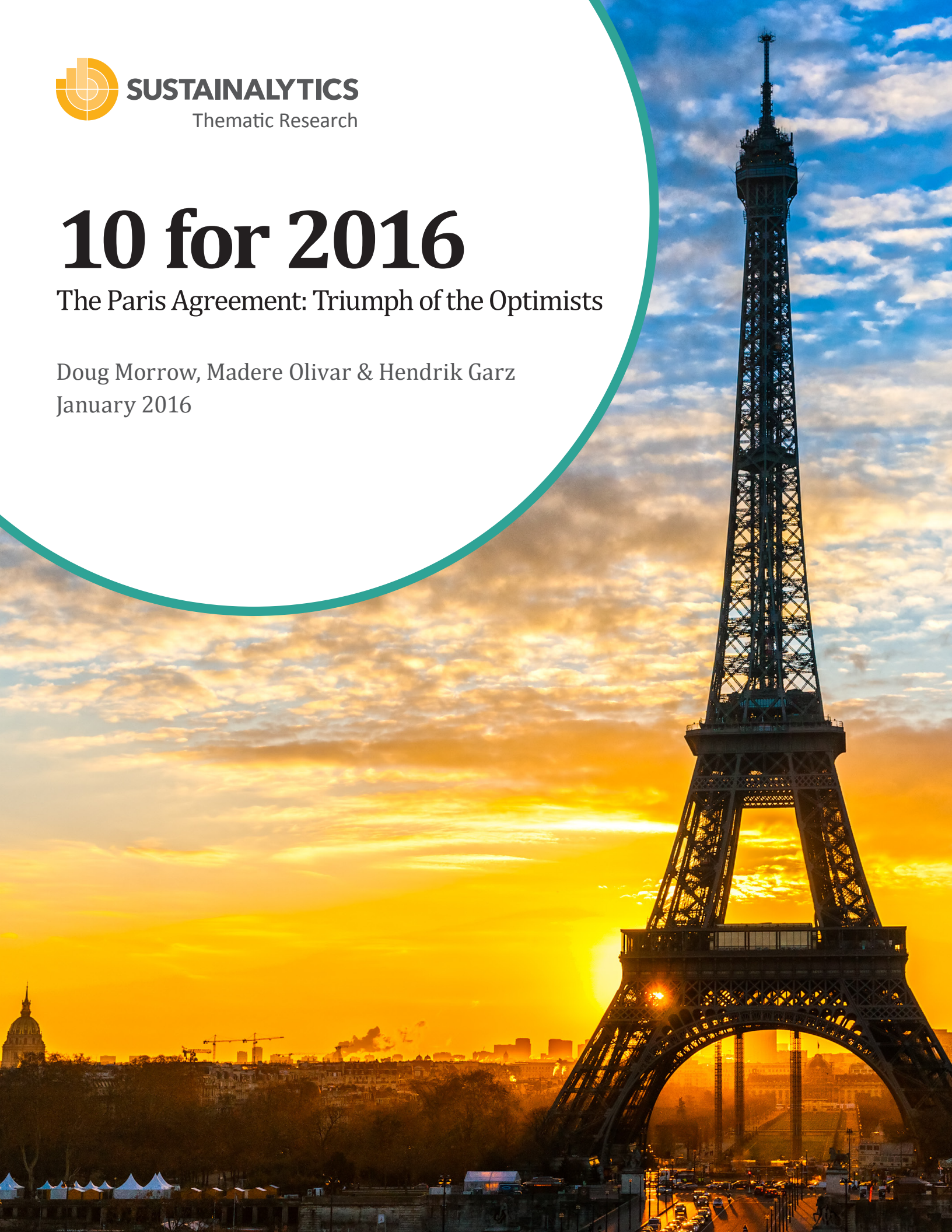

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Sustainalytics supports investors around the world with the development and implementation of responsible investment strategies. The firm partners with institutional investors that integrate environmental, social and governance information and assessments into their investment decisions.

Headquartered in Amsterdam, Sustainalytics is an independent ESG and corporate governance research, ratings, and analysis firm supporting investors around the world with the development and implementation of responsible investment strategies. With 13 offices globally, Sustainalytics partners with institutional investors who integrate environmental, social and governance information and assessments into their investment processes. Today, the firm has 240 staff members, including more than 120 analysts with varied multidisciplinary expertise across more than 40 sectors. In 2012, 2013 and 2014, Sustainalytics was voted best independent sustainable and responsible investment research firm in the **Extel IRRI survey.**

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Foreword

2016 – Sustaining Momentum, Remaining Vigilant

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By all accounts 2015 was another successful year for responsible investment (RI). ESG integration continued its path to greater mainstream acceptance, as the 10% year-over-year rise in PRI signatories (and 31% increase in assets under management) attested. While we highlight throughout this report the boost the Paris Agreement will provide to one specific asset class in the coming year – renewables – the seeds of renewables' success were sown in 2015. Low oil prices left a trail of devastation across the traditional fossil fuel industry, but renewables such as solar and wind attracted a record level of investment (USD 329.3bn, according to Bloomberg New Energy Finance). The economics of renewables appear to be turning, and if last year's trend continues – renewables accounted for about half of all new generation – 2016 could be the year we stop referring to renewables as "alternative energy".

I expect RI's momentum will continue unabated in most parts of the world, buoyed, in part, by increasingly supportive regulatory environments. From the US Department of Labor's guidance on ESG, to the strengthening of ESG disclosure rules by the Hong Kong and Singapore exchanges, to the European Parliament's support of measures to mandate the consideration of environmental risks in pension schemes' investment processes, policymakers appear to understand the importance of widening the investment lens to include a broader range of risks and opportunities.

There were also a variety of initiatives incubated last year shifting attention from security- and portfolio-level themes to a systems-focused perspective. I expect these discussions to pick up steam in 2016, as leading capital markets players begin to vigorously question whether current finance theories are pliable enough to support our increasingly interrelated and complex financial system. I'm keeping my eye on The Investment Integration Project, which published *Portfolios and Systemic Framework Integration: Towards a Theory and Practice*. In this report Steve Lydenberg takes on Modern Portfolio Theory (MPT) by calling for the development of a new investment framework that links systems-level and portfolio-level considerations.

Systems-level risk was highlighted most forcefully in November when the Financial Stability Board's (FSB) Mark Carney emphasized that policymakers need to evaluate three broad risks (physical, liability and transition) presented by climate change to ensure the ongoing resiliency of the financial system. Moreover, the FSB's launch of the Task Force on Climate-related Financial Disclosures (TCFD) is notable because it directs the spotlight on the deficient state of carbon data and reporting. It's not simply about a lack of transparency (only about 40% of the world's 4,500 publicly traded large cap companies report GHG emissions, according to 2014 industry data) – the real challenge at hand is to improve the poor quality of carbon data itself. For example, according to Sustainalytics' analysis of almost 1,600 reporters, approximately half report a year-over-year change in scope 1 or 2 emissions of greater than +/- 20% (more alarmingly, two thirds of utilities and 56% of energy companies exhibit the same

reporting pattern). Clearly, this raises uncomfortable questions about the integrity and impact of current carbon-based integration and product development. As the FSB highlights, "[a]ppropriate disclosures are a prerequisite for stakeholders not only to manage and price these risks accordingly but also, if they wish, to take lending or investment decisions based on their view of transition scenarios."

The lead-up to COP21 in Paris galvanized the global RI community and was, from my perspective, the most important driver of change in the ESG space last year. Accordingly, Sustainalytics has devoted its entire 10 for 2016 report to this topic – breaking down the most salient aspects of the Paris Agreement, highlighting potential opportunities for investors from a macro perspective, and presenting a bottom-up assessment of 10 company stories that we believe are worth watching in 2016.

But it won't all be smooth sailing and, as always, I see challenges ahead. Volatile financial markets are a serious concern, and that distraction shows no signs of abating anytime soon. Moreover, an uncertain outcome to the US presidential election, and China's economic slowdown, leave me wondering whether the international community and investors will have the resolve to push forward with their pledges.

But despite these challenges, I remain optimistic. In part, my optimism is fueled by the fact that a growing number of investors not only evaluate climate change risks and opportunities because it makes economic sense, but because they believe they're uniquely positioned to act to ensure temperature increases are limited to agreed-upon levels. Among other examples of this commitment, the Portfolio Decarbonization Coalition covers USD 600bn in assets (far surpassing the initial target of USD 100bn), while 117 investors with collective assets under management of USD 10trn have signed the Montreal Pledge. But ultimately there's a more powerful impetus for investors to head down a bolder path in 2016, as argued so passionately by former US Vice President Al Gore at the Investor Summit on Climate Change – they have a moral responsibility to do so.

Michael Jantzi, Chief Executive Officer

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Key Findings

Macro picture – an ambitious but incomplete solution

- The Paris Agreement and follow-up national climate commitments are expected to serve as a **positive long-term economic signal** for low-carbon technologies.
- Current INDC targets are forecasted to limit the increase in global temperatures to 2.7° C – **well above the 2° C pathway** – but countries' future pledges must be progressively ambitious and may close some of this gap.
- The deal reveals a fundamental transition in multilateral climate negotiation, away from a legalistic, top-down approach to a more **flexible, country-driven stance**.
- Article 13 lays the groundwork for **improving the comparability** of national GHG emissions, which could have a positive effect on corporate reporting practices.
- While the Paris Agreement may pose a **long-term structural challenge** for oil, gas and coal companies, it is far too early to herald the end of fossil fuels.
- Emerging discourse about **climate change as a systemic risk** may trigger more collaboration among institutional investors and UNFCCC parties.

Micro picture – companies taking unique steps

- Our *10 for 2016* **showcase the diversity of approaches** that may be taken by companies to address the multidimensional challenges posed by climate change.
- Many of our selections, including **Tesla**, Norway-based **Borregaard** and **Cisco**, are developing products that are likely to thrive as emissions regulations tighten.
- Our story on **Kellogg** shows how food companies can minimize their exposure to the physical risks of climate change by setting aggressive emissions reduction targets and pushing adaptation strategies through their supply chains.
- Australia's **Origin Energy** and Germany's **RWE** illustrate the challenges for carbon-intensive companies of adapting to climate change regulation.

Inching towards a carbon-constrained economy

The Paris Agreement has put climate change on the map for a new generation of investors

In this year's installment of our "10 for" series, we build off of last month's COP21 Paris conference and concentrate on the investment thematic of climate change. The first chapter looks at the Paris Agreement, which has put climate change on the map for a new generation of investors. We analyze the deal's most salient features and discuss the major takeaways for investors. In some ways, it is simply too early to ascertain the full implications – much will depend on how closely countries follow their commitments. We argue that the deal signals a fundamental change in the way the international community manages climate change, and provides a positive long-term signal for low-carbon technologies. We also explore a potential role for asset owners in monitoring countries' reduction commitments, based on the growing recognition of climate change as a systemic risk.

Our 10 selections extend beyond conventional examples

In the second chapter, we look at opportunities for investors from a bottom-up perspective by profiling 10 companies from our coverage universe that are "getting ahead of the climate change curve". Our selections, which extend well beyond the conventional examples of renewable energy providers and cleantech firms, may offer investors unique ways to play the regulatory, market and physical impacts of climate change.

Taking a look back

We conclude the *10 for 2016* by providing an update on our 10 selections from last year's report. We revisit our original outlook, review the companies' performance over the past 12 months and assess whether the stories are progressing "on track". Our findings show that the financial impact of ESG issues can sometimes be drowned out by the effect of fundamentals factors, particularly over the short run.

The 10 for 2016

Company	Country	Industry	Theme
Tesla	US	Automobiles	Energy storage visionary
Borregaard	Norway	Chemicals	Alternative petrochemicals
LG Chem	South Korea	Chemicals	Lithium-ion batteries and energy storage products
Kellogg	US	Food Products	Driving climate adaptation in the supply chain
L'Oreal	France	Household Products	Climate change programmes and brand effects
General Electric (GE)	US	Industrial Conglomerates	Acquires Alstom's power assets
Allianz	Germany	Insurance	Moving from coal to clean energy financing
Origin Energy	Australia	Oil & Gas Producers	Positioning for Australia's solar boom
Cisco	US	Technology Hardware	Internet of Things and smart city development
RWE	Germany	Utilities	Restructuring of clean assets

Source: Sustainalytics

The Paris Agreement

Distilling the key points

Mobilizing a global response to climate change

The Paris Agreement, adopted on 12 December 2015 by 196 countries within the United Nations Framework Convention on Climate Change (UNFCCC), seeks to mobilize a global response to climate change post-2020. Its overarching objectives are to:

- Hold the increase in the global average temperature to well below 2° C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5° C above pre-industrial levels;
- Increase the world's ability to adapt to the adverse impacts of climate change and foster climate resilience; and
- Make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.[1]

The Paris Agreement has been both celebrated and criticized

Any deal signed at the Paris conference was sure to be heavily criticized and celebrated. The Paris Agreement has been considered both a triumph and travesty; as one reporter commented, "by comparison to what it could have been, it's a miracle. By comparison to what it should have been, it's a disaster."[2] The wide spectrum of reactions reflects both the urgency of the climate change threat and the challenges of multilateral negotiation. Below we discuss the key elements of the deal.

Taking a bottom-up perspective

Fresh political momentum

The Paris Agreement signals a new era in the international community's approach to managing the risks and impacts of climate change. While there is a certain elegance in top-down frameworks such as the Kyoto Protocol, the deal shows that we have transitioned to a bottom-up strategy where countries can develop "local solutions". That this new type of flexible, country-driven approach was endorsed by 196 highly diverse economies shows fresh political momentum to take action on climate change, particularly in light of the failure of COP15 in Copenhagen.

A political non-starter

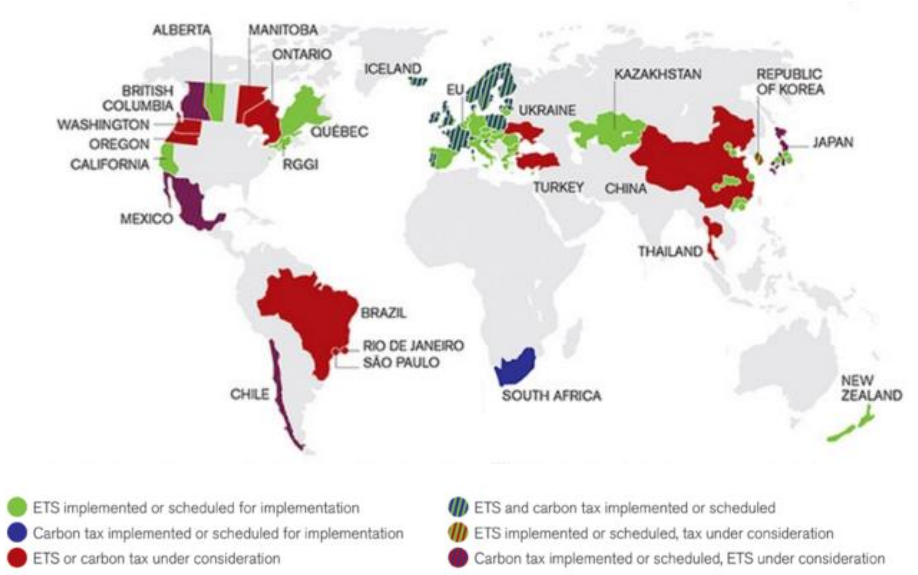
The transition to a bottom-up approach manifests itself in several ways. For instance, the Paris Agreement does not introduce a global carbon price. Christiana Figueres, the UN's climate chief, stated earlier this month that the agreement did not set a carbon price because it "did not attract unanimous country support deemed necessary."[3] This is hardly surprising – a global carbon price has always been a political non-starter, even though investor and company support for carbon pricing clarity is at an all-time high.

National or regional carbon regimes are more likely

Putting a price on carbon may indeed be necessary to keep global temperatures on the 2° C trajectory (let alone the 1.5° C trajectory), but such regimes are much more likely to occur at a national or regional level. Indeed, as shown on the map on p. 9, carbon pricing mechanisms are present in 40 countries and 20 sub-national jurisdictions, covering approximately 12% of global emissions.[4] While the Paris Agreement moves away from any type of top-down global carbon price, it is supportive of regional carbon trading and market-based mechanisms to achieve emissions reductions.[5]

Map of global carbon pricing

Carbon is currently priced in 40 countries and 20 sub-national jurisdictions



Source: World Bank[6]

A closer look at voluntary targets

No penalties for missing INDC targets

The bottom-up nature of the deal is also evident in the use of voluntary emission reduction targets. The reduction targets submitted by parties in their Intended Nationally Determined Contributions (INDCs) are not binding, and there is no legal mechanism to penalize countries that do not meet their targets.[7] This contrasts with the legally binding targets that underpinned the Kyoto Protocol, the Paris Agreement's predecessor.

Examples of emissions reduction targets submitted in INDCs

- US to cut emissions 27% below 2005 levels by 2025
- EU-28 to cut emissions 40% below 1990 levels by 2030
- Canada to cut emissions by 30% below 2005 levels by 2030
- Japan to cut emissions by 26% below 2013 levels by 2030
- China to reduce CO_2 emissions per unit of GDP by 60% below 2005 levels by 2030

Source: WRI[8]

Countries face incentives to meet voluntary targets

While critics stress that countries can walk away from voluntary targets if they prove too financially onerous, we think such criticism is largely misplaced. In the first instance, legally binding targets are less binding than sometimes assumed, as demonstrated when Canada exercised its legal right to withdrawal from the Kyoto Protocol in 2011.[9] Moreover, it may be myopic to interpret voluntary targets from a strict positivist standpoint. Countries face a variety of different incentives to pursue voluntary targets in good faith, as recent research in the international relations field has shown.[10]

Improving transparency

An informal accountability system

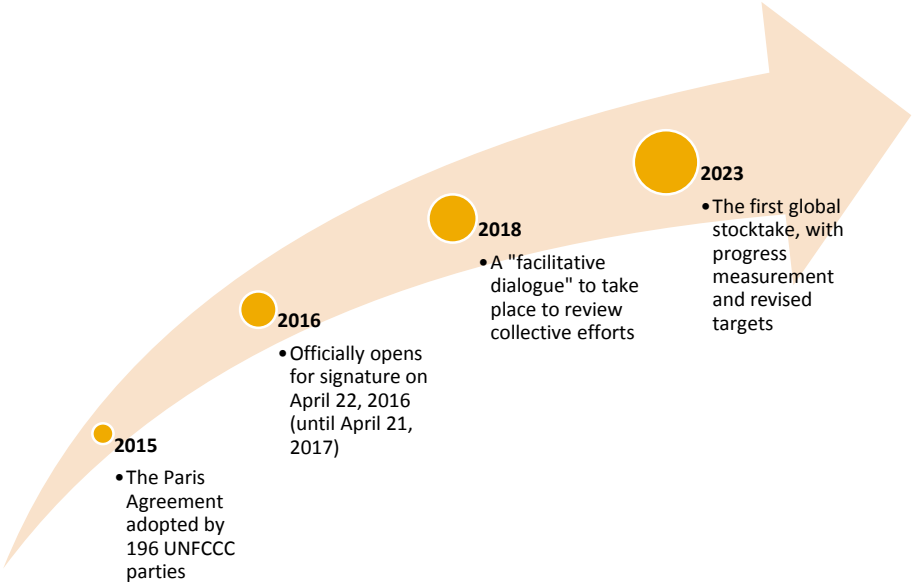
While the deal's voluntary targets have provoked disagreement, provisions to improve the transparency of emissions reporting and measurement have been met with almost universal acclaim. The targets themselves are voluntary, but parties to the Paris Agreement are legally obliged to publicly report on progress made towards their targets every five years, beginning in 2023 at the first global "stocktake". Countries are also obliged to ratchet up the "ambition" of their reduction target at the 2023 meeting and at every five-year meeting thereafter.[11] While it is unclear how countries will interpret these provisions, we expect this architecture to serve as an informal accountability system, providing a check on countries' performance against their targets.

Improving the comparability of emissions data

At the same time, Article 13 of the deal calls for a technical expert review process to improve the uniformity of emissions reporting against established standards.[12] This lays the groundwork for improving the comparability of GHG emissions data reported by countries, which could trickle down to corporate reporting practices. This is a clear win for investors, as inaccuracies in GHG emissions accounting have been one of the main barriers preventing a more wholesale integration of companies' climate change exposure into valuation frameworks. Moreover, many countries' national emissions inventories face data gaps, especially in emerging markets. Article 13 is not a panacea for all of the challenges associated with emissions accounting, but it is certainly a step in the right direction.

Next steps for the Paris Agreement

Towards a global stocktake in 2023



Source: Sustainalytics

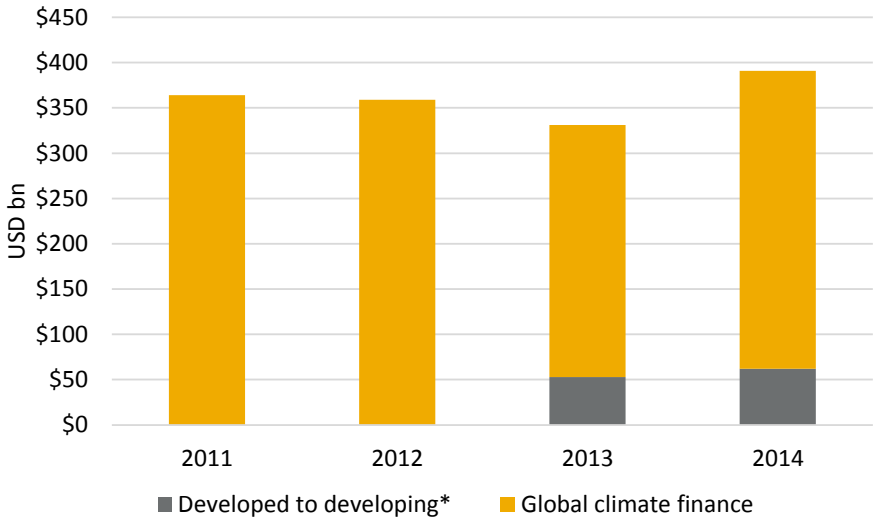
A global view, but who will pay?

A USD 100bn commitment

While the Paris Agreement brings developing countries into the tent, important questions remain about financing. Many have been quick to laud the Paris Agreement for recognizing the need to boost climate finance, but in fact the deal includes no new legally binding provisions. Developed countries had already committed at COP15 in 2009 to "mobilize" USD 100bn in annual climate financing by 2020 to address the needs of developing countries.[13] However, according to The Climate Policy Initiative, of the USD 391bn in global climate finance flowing in 2014, roughly USD 62bn flowed from developed to developing countries, leaving a shortfall of USD 38bn against this target.[14]

History of global climate finance

In 2014, roughly USD 62bn flowed from developed to developing countries, a shortfall of USD 38bn against the COP15 commitment



* Data unavailable for 2011–2012

Source: Climate Policy Initiative,[15] Sustainalytics

Home bias of private investors

Part of the challenge is that private investors, which account for over 60% of total climate finance and include commercial banks, corporations and project developers, prefer local markets, due to familiarity and the perception of lower risk. In 2014, over 90% of climate finance provided by private investors in both the developed and developing world remained in the country of origin.[16] While the preamble of the Paris Agreement urges developed countries to increase annual financing beyond USD 100bn and extends the commitment to 2025, these barriers were not addressed.

An incomplete solution

Complete realization of INDC targets would still leave an emissions gap

The Paris Agreement is a historic diplomatic achievement, and it signals new political momentum to address the risks of climate change. But it is also widely recognized to be an incomplete solution, at least in the context of keeping the world on a 2° C pathway. Based on data from Climate Action Tracker, the emission reduction pledges expressed by parties in their INDCs are forecasted to reduce global emissions in 2030 by six gigatonnes (Gt) of carbon dioxide equivalent (CO_2e), about the same as total emissions in the US today. But this would still leave an "emissions gap" of about 16 $GtCO_2e$ relative to the 2° C pathway.[17] Put another way, full implementation of the

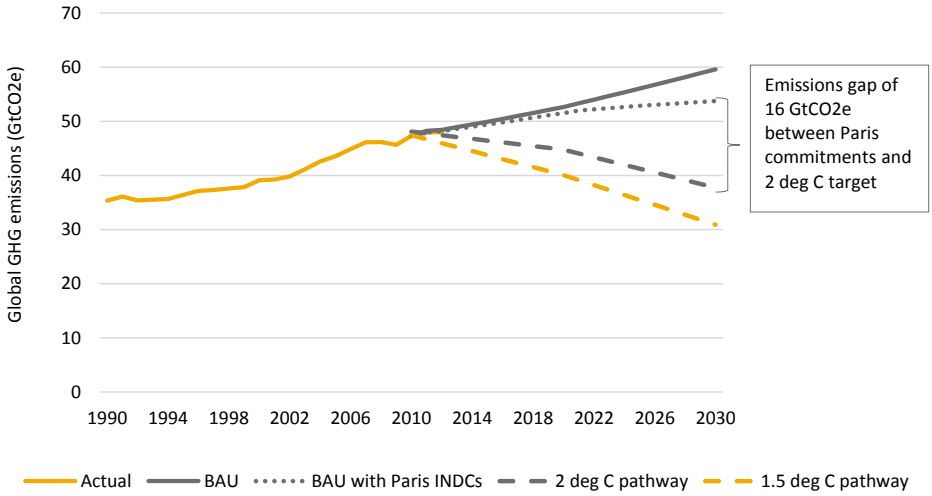
INDCs is expected to reduce the median temperature increase by about 1° C from business as usual (BAU) conditions, from 3.6° C to 2.7° C by 2100.[18]

A phase-out of fossil fuels?

From this perspective, the Paris Agreement is a robust starting point, but commitments are not yet sufficient to avert the most catastrophic climate impacts. Indeed, by the UNFCCC's own admission, achieving the 2° C target will require countries to peak their GHGs "as soon as possible", and "achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century."[19] Most experts have interpreted this to mean net zero emissions between 2050 and 2100, which implies a complete phase-out of fossil fuels.

Actual and Projected Global Greenhouse Gas Emissions

Full implementation of the INDCs is expected to reduce the median temperature increase to 2.7° C by 2100



Source: Sustainalytics, based on data from Climate Action Tracker, 2015

Implications for investors

In this section we assess some of the macro implications of the Paris Agreement for investors. While there is uncertainty about how closely countries will follow their commitments, and how quickly they will ramp up the ambition of their reduction targets, some general conclusions can still be drawn.

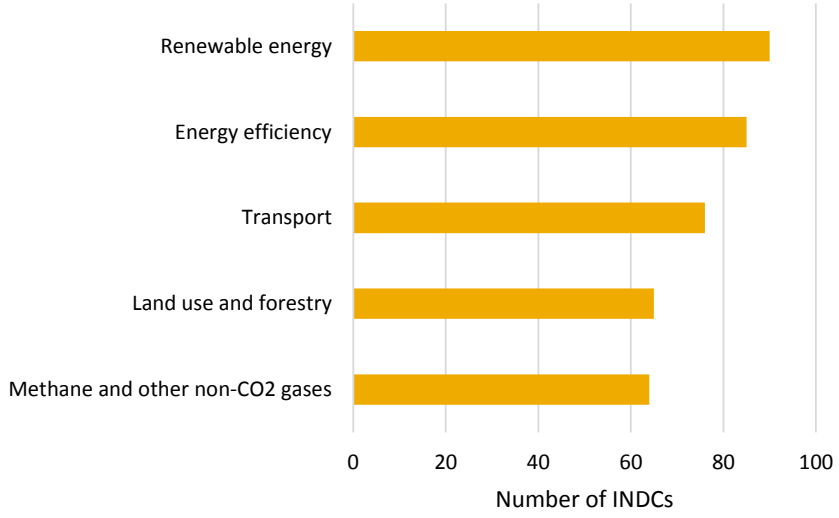
A positive economic signal for low-carbon technologies

INDCs speak to a fundamental energy transition

First and foremost, we expect the deal and the follow-up emissions reduction initiatives implemented by countries will serve as a positive economic signal for low-carbon technologies. The 160 INDCs that have been submitted as of 29 January, representing 187 countries and 99% of total global emissions,[20] offer valuable insight into the types of strategies being used, and the sectors being targeted, on a country-by-country basis. A synthesis report prepared by the UNFCCC found that roughly 90 INDCs describe plans to boost renewable energy through the use of feed-in tariffs and other measures.[21] Over 80 INDCs target energy efficiency in industry and buildings, while approximately 75 discuss strategies to reduce transport sector emissions through improvements to public transport and fuel efficiency standards.

Priority areas mentioned in INDCs

Roughly 90 INDCs discuss plans to boost renewable energy



Source: UNFCCC

Investment themes by IPCC sector

While it is outside the scope of this report to offer detailed analysis about specific low-carbon technologies within these INDC priority areas, the chart below provides an overview of investment themes in each of the five Intergovernmental Panel on Climate Change (IPCC) sectors that are broadly expected to benefit as countries implement their INDCs and tighten their emissions profiles.

Investment opportunities by IPCC sector

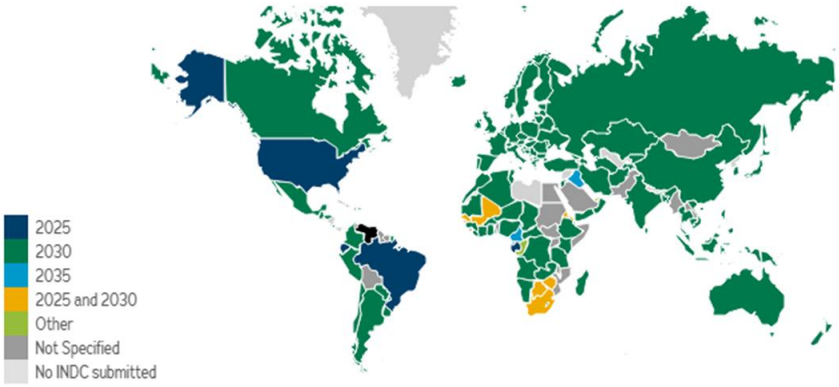
Sector	Investment theme				
Energy	Solar and wind	Hydro	Geothermal	Carbon capture	Energy storage
Agriculture	Adaptation	Meat replacement	Forestry management	Urban farming	Precision agriculture
Industry	Energy efficiency	Big data	Sharing economy	Nanomaterials	Waste management
Transport	Engines	Electric vehicles	Fleet logistics	Modal shift	Biofuels
Buildings	Insulating materials	Lighting	Smart metering	Internet of Things	Appliances

Source: Sustainalytics, The Generation Foundation[22]

INDCs are not comparable

The main challenge for investors is that the INDCs are not directly comparable. There are differences in target type, as well as in baselines and scope. As shown on the map on p. 14, most countries expect to reach their targets by 2030, although some, including the US and Brazil, expect to reach them by 2025. Investors would clearly benefit from a standardization of INDCs or the development of national "Climate Investment Plans", which have been called for by some groups.[23]

Time frame of reduction targets described in INDCs



Source: WRI[24]

The take-off of renewables?

Growth driven by three factors

Much has been made about how renewables – solar and wind in particular – are the winners of the Paris Agreement. This may be true from a future deployment perspective. As mentioned earlier, roughly 90 INDCs describe plans to boost renewable energy, and over half of the world's new power generation capacity in 2014 was in renewables.[25] It is outside our scope to fully assess these trends, but we see growth in renewables being driven by several factors:

- The increasing cost competitiveness of renewable generation (analysis conducted by Lazard as of November 2015 puts the levelized cost of wind and utility scale solar PV *below* that of gas, coal and nuclear);[26]
- The "enabling solution" that renewables provide to governments and companies seeking to lower their emissions;
- The ability of distributed generation – solar PV in particular – to bring electricity to off-grid populations (this is an especially important driver in the case of India); and
- The role that renewables can play in helping countries achieve energy security and geopolitical independence.

Barriers are formidable

Regular readers of our thematic reports will know that we take a bullish view of renewables, and the Paris Agreement seems likely to further improve their fundamentals. But it is easy to predict a rosy future for renewable generation without taking account of the existing challenges, which may be technical, financial or political. We briefly highlight below some of the key barriers:

- Price distortions caused by fossil fuel subsidies (the International Energy Agency estimates that global fossil fuel subsidies in 2013 totalled USD 548bn, compared to USD 121bn for renewables);[27]
- The technical intermittency challenge of wind and solar (although as we address in our **Tesla** and **LG Chem** stories, significant advances are being made in energy storage that help address this barrier);
- Immature financing mechanisms; and
- The infrastructure advantage of established energy systems.

Investor confidence in renewables is tied to government policy

Though the COP21 represents a giant leap forward in international climate-oriented cooperation, it has not erased the political difficulties for companies dependent on government subsidies to ramp up investments in renewables, as our **RWE** and **Origin** stories show. And as shown in the UK's recent decision to slash subsidies for small and medium-scale solar and wind energy projects, investor confidence in renewables is often closely tied to government policy.[28]

Implications for fossil fuel investors

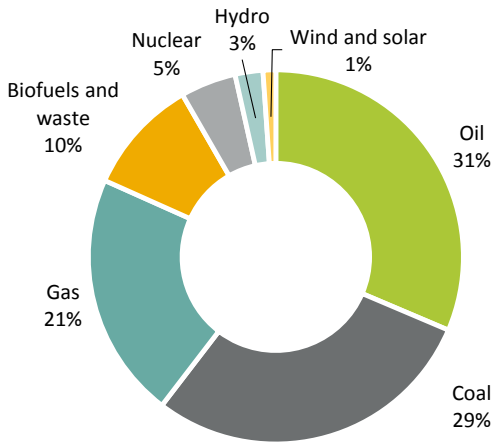
Fossil fuel companies face a long-term structural challenge

Article 4 of the Paris Agreement recognizes that achieving the 2° C target will likely require a phase-out of fossil fuels between 2050 – 2100. This is consistent with analysis conducted by Carbon Tracker, which argued in a landmark 2011 study that up to 80% of the known reserves of the world's largest fossil fuel companies would need to stay in the ground in order to reach the 2° C target.[29] Should oil, gas and coal investors be worried? It is hard to avoid the conclusion that they should be, in the long run. In the short run, much will depend on the credibility of the reduction targets agreed to at Paris, and how quickly countries ratchet up the ambition of their targets. We expect the market will increasingly price in companies' exposure to these risks going forward, and there are already signs that the Paris Agreement may have (temporarily) moved the market against coal companies. Shares in Peabody Energy, the world's largest coal producer, were down 13% on the first day of trading after the deal had been signed.[30] The MAC Global Solar Energy Index, on the other hand, went up by 4.5%.[31]

Over 80% of global primary energy supply comes from oil, coal and gas

Of course, any transition to a clean energy economy is not going to happen overnight. According to the International Energy Agency (IEA), oil, coal and gas currently account for over 80% of the global primary energy supply.[32] The IEA forecasts that full implementation of the INDCs will slow down fossil fuel demand growth, but low-carbon fuels (which include biofuels, nuclear, hydro, wind and solar) are still expected to account for only 25% of the global energy mix in 2030.[33] This estimate could indeed be downward biased – the IEA has consistently underestimated the penetration of renewables in their forecasts – but the enormity of the challenge is clear enough.

Global primary energy supply

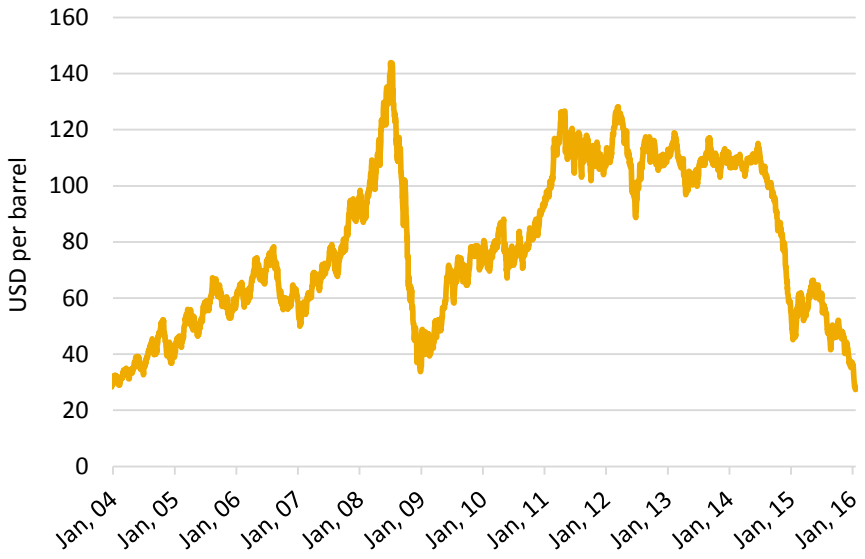


Source: IEA[34]

A structural challenge for fossil fuel companies

While the Paris Agreement poses a long-term structural challenge for oil, gas and coal companies, this does not mean that investors cannot find value in fossil fuel companies. Indeed, as a portfolio manager in Canada recently put it, "the biggest risk today isn't being invested in energy stocks. It's not being invested in energy stocks."[35] This line of thinking relates to the oil price which, as shown in the chart below, has slid below USD 28 per barrel for the first time since November 2003.[36] We do not wish to speculate on the future of oil prices, but the current market consensus of sustained low prices through 2016 could turn out to be as unfounded as Goldman Sachs' 2011 forecast of USD 140/barrel in 2012[37] or, most spectacularly, the 2008 forecast from the former chief economist of Canada's fifth-largest bank that oil would reach USD 200/barrel.[38]

Global oil prices, January 2004 – January 2016



Source: US Energy Information Administration[39]

Agriculture – Relatively neglected by investors

A significant proportion of agricultural emissions are outside the reach of investors

Renewable energy might be one of the darlings of the low-carbon world, and many of the investment themes shown on p. 13 are likely to resonate with investors. But despite accounting for nearly a quarter of global GHG emissions, and being severely exposed to the physical impacts of climate change, the Agriculture sector is sometimes overlooked by investors looking to capitalize on climate change-driven investment opportunities. This may be because the sector's emissions tend to be generated on large farms, which, while corporate, tend not to be publicly traded. The leverage that institutional investors hold in this context is through engagement with large publicly traded food companies, such as **Kellogg**, on how they manage their supply chains.

The challenges of eating less meat

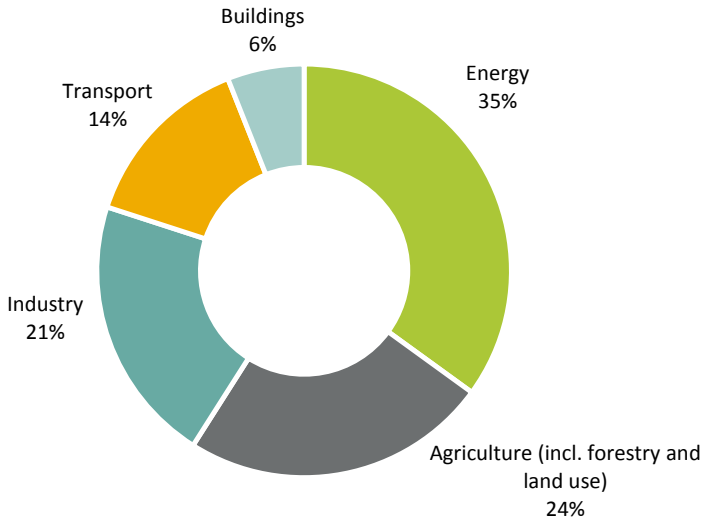
The Agriculture sector is also distinguished by its mitigation solutions, many of which involve challenging or, to borrow Vice President Al Gore's phraseology, *inconvenient* lifestyle choices. For instance, the fifth assessment report of the IPCC singles out "dietary changes" – which effectively translate to eating less meat – as one of the most significant ways to reduce GHG emissions from the food production life cycle.[40] Yet according to the Organization for Economic Co-Operation and Development (OECD),

global meat consumption is projected to increase more than 4% over the next 10 years, from a current average of 75 pounds per person to 78 pounds (by way of comparison, the average American currently consumes 198 pounds of meat each year).[41]

Sixty INDCs include measures to reduce agricultural emissions

However, there are certainly less inconvenient mitigation solutions available, and opportunities for investors may be growing. The UNFCCC synthesis document shows that approximately 60 INDCs include plans to reduce emissions in the Agriculture sector by improving crop and livestock production and developing waste-to-energy facilities.[42]

Global emissions by sector



Source: IPCC[43]

More investor action on climate change

More investor action on the horizon

A second implication of the Paris Agreement is that we expect it will create renewed demand among investors to measure the carbon footprint of their portfolios and gauge their exposure to the issue of stranded assets. The deal has clearly raised the market's awareness of the financial risks and opportunities of climate change, and investors are likely to be motivated to take more concrete action on these issues in 2016.

Portfolio measurement

The Montreal Pledge is supported by US 10trn in assets

A clear action point for investors in 2016 will be to determine the carbon footprint of their investment portfolios. At the time of writing, 120 investors with collective assets under management of US 10trn have signed the Montreal Pledge, which (voluntarily) commits signatories to measuring and publicly disclosing the carbon footprint of their investment portfolios on an annual basis.[44] Additionally, the Portfolio Decarbonization Coalition, which commits signatories to "withdrawing capital from particularly carbon-intensive companies… and re-investing that capital into particularly carbon-efficient companies…",[45] has attracted 25 global investors (including **Allianz**, as discussed on p. 45) with collective assets of USD 600bn. While some investors to these initiatives may be primarily motivated by the reputational benefits to be gained by membership in such highly visible climate change organizations, the rapid success of the Montreal

Pledge and Portfolio Decarbonization Coalition suggests a substantial increase in the perception and prioritization of carbon-related risks by investors.

Stranded assets

Investors are divesting from coal companies

The Paris Agreement will likely lead more investors to consider their exposure to the issue of stranded assets. As we discussed in our recent paper on divestment, Fossil fuel divestment – A shareholder perspective, fossil fuel divestment is something of a misnomer; at least among fiduciary investors, virtually all of the announcements to date have targeted coal companies. While this partly reflects the relative ease with which investors can divest from coal from a portfolio rebalancing standpoint, it is mostly a function of the severe economic headwinds facing the coal sector. These include negative price effects from the US shale gas bonanza, the surge of renewable generation and tightening environmental regulations, which have hit coal hardest because it is the most polluting fossil fuel. However, the Paris Agreement and general regulatory momentum on climate change pose a long-term structural challenge for oil and gas companies, and we certainly would not rule out the possibility of a "second wave" of divestment activity focused on oil and gas stocks.

High-profile fossil fuel divestments

Investor	Date of announcement	Total AUM (USD bn)	Divestment (USD bn)	Affected AUM (%)	Target	Revenue test*
Allianz	Nov-2015	$522	$4.28	0.82%	Coal companies, utilities	30%
PFZW	Nov-2015	$172	$1.80	1.05%	Fossil fuel companies	Not disclosed
CalPERS/CalSTRS	Sep-2015	$476	$0.19	0.04%	Coal companies	50%
Aviva	Jul-2015	$354	Not disclosed	N/A	Coal companies	30%
Norwegian Sovereign Wealth Fund	Jun-2015	$890	$8.00	0.90%	Coal companies, utilities	30%
AXA	May-2015	$615	$0.56	0.09%	Coal companies, utilities	50%
Nordea	Jan-2015	$228	$0.11	0.05%	Coal companies	75%
AP2	Oct-2014	$40	$0.12	0.30%	Fossil fuel companies	Not disclosed
Rockefeller Brothers Fund	Sep-2014	$0.86	$0.06	6.98%	Fossil fuel companies	Not disclosed

* Some investors target companies that earn more than half of their revenue from fossil fuels. **Source**: Sustainalytics

Recognizing climate change as a systemic risk

The Paris Agreement accelerated the trend towards climate change being recognized as a systemic risk

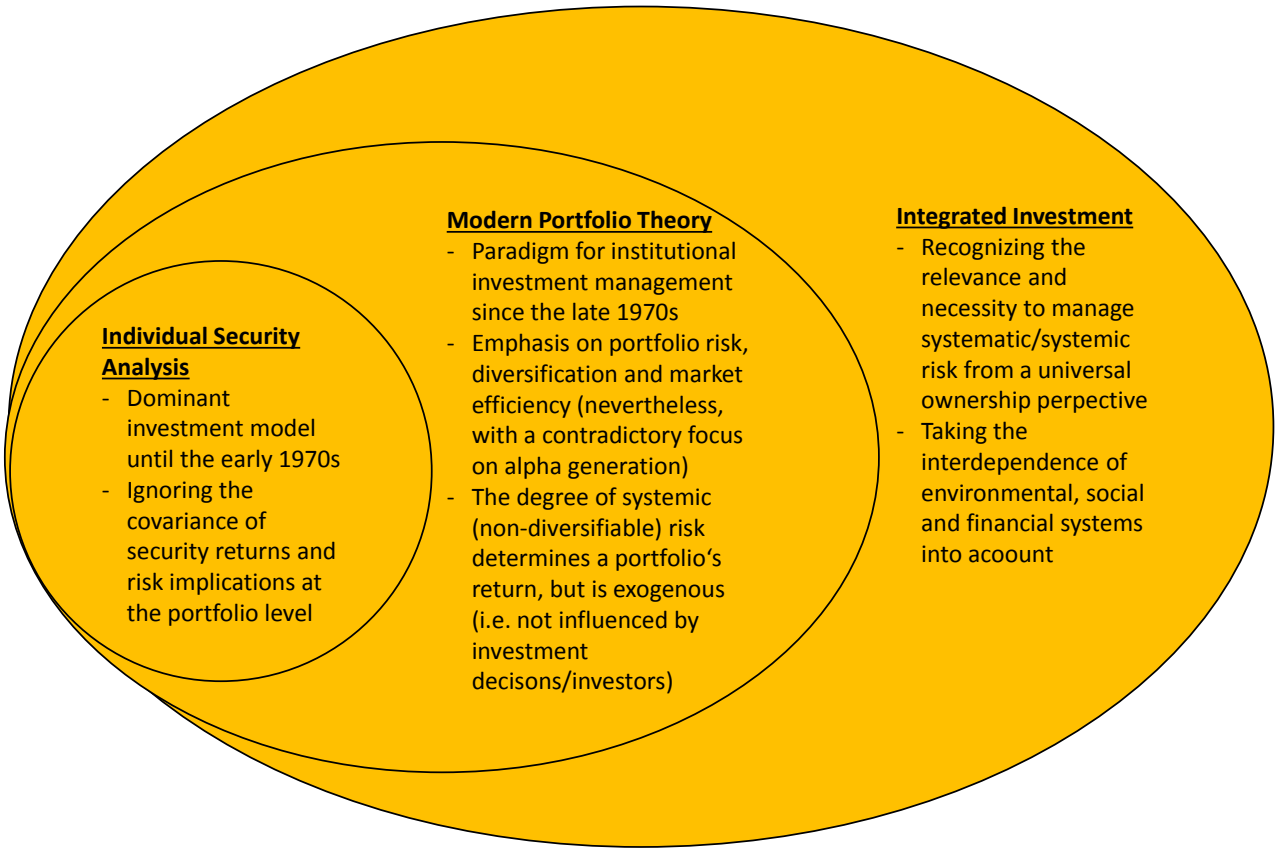
In the afterglow of the Paris deal, we expect institutional investors to increasingly contemplate the extent to which their investment decisions may be contributing to systemic risks related to climate change and, as a corollary to that, to redefine their role as more *forceful stewards* of their investments.[46] The Paris Agreement is certainly not the only catalyst for broadening investors' risk management around climate change. Others include:

- the announcement of the Financial Stability Board (FSB) in December that it would establish a disclosure task force on climate-related financial risks;[47] and
- the Principles for Responsible Investment (PRI) plan to add a seventh principle that addresses how investors manage the systemic impacts of their investments.

The limitations of Modern Portfolio Theory

This taps into the growing discourse in the investor community about the need for integrating a systemic perspective into investment decision-making frameworks, going beyond the current paradigm, which has predominantly been shaped by the implications of Modern Portfolio Theory and which has largely ignored environmental and social externalities. With climate change recently recognized by the World Economic Forum as the single biggest potential threat to the global economy in 2016, the dissemination of such frameworks appears to have gained additional urgency.

Envisioned evolution of investment frameworks



Source: Sustainalytics, based on the work of Steve Lydenberg[48]

The shifting definition of a universal owner?

Call for expanding the responsibilities of a universal owner to include a systemic impact consideration

The call for an extension of investment frameworks or approaches to include a systemic component (e.g. Steve Lydenberg's "Integrated Investment" framework,[49] represented in the graphic above) is not new, but should be seen as a continuation of the long-debated universal ownership hypothesis. This hypothesis has historically been understood to describe why large institutional asset owners that are invested broadly in the overall market should be concerned about the impact of negative externalities on their portfolios from a traditional fiduciary duty point of view. The growing discourse in the investor community about the need for integrating a "systemic perspective" into investment decision-making may now lead to an even broader understanding about the responsibilities of a universal owner. It may also lead some investors to play a more collaborative role with UNFCCC parties than they have historically. We do not necessarily foresee asset owners playing the role of "climate cops", but we can certainly envisage more spirited engagement with governments on their approach to managing climate risks and progress against their INDC targets.

Harbingers of a broader move toward systems-level stewardship and engagement

We conclude by reiterating that we firmly believe the Paris Agreement will be a catalyst for a redefinition for the role of institutional investors as more *forceful stewards* of their investments. In conjunction with initiatives like the Montreal Pledge and the Portfolio Decarbonization Coalition, as well as the recent FSB announcement and the possibility of a seventh PRI principle focused on systemic impacts, the Agreement is a harbinger of a broader move toward systems-level stewardship and engagement (including the coverage of issues beyond climate change).

10 for 2016

Investment opportunities post-Paris

We expect the market to attach a greater premium to corporate carbon fundamentals

In this chapter we move from a top-down assessment of the Paris Agreement to a bottom-up analysis of 10 companies that are "getting ahead of the climate change curve". Covering six countries and nine industries, the *10 for 2016* showcase the diversity of approaches that may be taken by companies in response to the risks and opportunities posed by climate change. Businesses today are competing against a backdrop of intensifying climate impacts, tightening emissions regulations, shifting national energy strategies and changing market dynamics for low-carbon products and services. In light of these trends, we expect the market will begin to attach a greater premium to companies with superior energy efficiency, carbon management and climate resilience and, on the upside, companies that are developing climate-driven products or services.

Stories from the field

Tesla is primarily an energy storage play

The *10 for 2016* offer investors unique ways to play the regulatory, market and physical impacts of climate change. Many of our selections take a classic upside angle. These include pure-plays, such as **Tesla**, which we increasingly see as an energy storage play, and **Borregaard,** a small but highly innovative player in the growing market for petrochemical alternatives.

LG Chem supplies the EV and renewable energy markets

We also look at large conglomerates that are diversifying into low-carbon products and services. These include **Cisco**, which is betting big on the Internet of Things and smart city development, and South Korea's **LG Chem**, which is enviably positioned as a provider of backbone technologies to the electric vehicle, solar PV and wind power markets. Driven by a mixture of regulation and self-interest, **Origin Energy** is building its competencies in renewables and scouting opportunities in the residential rooftop and large-scale solar markets in Australia. **GE** recently completed its USD 9.5bn acquisition of Alstom, based in part on a favourable outlook for wind power.

Kellogg is pushing adaptation through its supply chain

Our story on **Kellogg** shows the effect that climate change impacts are already having on food security, and looks at what large companies can do to minimize business risk by pushing adaptation strategies through the supply chain.

L'Oreal is not a household name in the climate change context, but we are intrigued by the way the company has tied its brand to climate change leadership. If companies like L'Oreal are able to leverage carbon reduction efforts to increase brand loyalty, this may point the way forward for companies in other (carbon-heavier) industries.

Our story on **Allianz** traces the company's evolution from one of the world's top fossil fuel financers to its landmark decision in 2015 to end investments in coal-heavy companies and double down on clean energy financing.

Our analysis of Germany's **RWE** looks at the spinoff of the company's renewable energy assets. While RWE's spinoff simplifies the complex management of the company's conventional and new energy businesses, it is certainly not a magic bullet for a return to profitability.

The 10 for 2016

Company	Country	Industry	Theme
Tesla	US	Automobiles	Energy storage visionary
Borregaard	Norway	Chemicals	Alternative petrochemicals
LG Chem	South Korea	Chemicals	Lithium-ion batteries and energy storage products
Kellogg	US	Food Products	Driving climate adaptation in the supply chain
L'Oreal	France	Household Products	Climate change programmes and brand effects
General Electric (GE)	US	Industrial Conglomerates	Acquires Alstom's power assets
Allianz	Germany	Insurance	Moving from coal to clean energy financing
Origin Energy	Australia	Oil & Gas Producers	Positioning for Australia's solar boom
Cisco	US	Technology Hardware	Internet of Things and smart city development
RWE	Germany	Utilities	Restructuring of clean assets

Source: Sustainalytics

Tesla Motors

From EV pioneer to energy innovator

57 — **Overall ESG Score**: Average Performer

22 out of 47 — **Relative Position**: Fifth decile

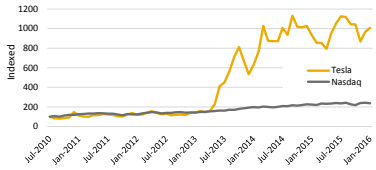
1 — **Highest Controversy Level**: Quality & Safety

Domicile: United States
Industry: Automobiles
Ticker: TSLA (Nasdaq)
ISIN: US88160R1014
Employees: 12,000
MCap (USD m): 31,413*
** as of Dec. 31/2015*

Key insights

- The kickoff of the Gigafactory through a USD 5bn investment is a milestone for 2016, and will help boost **Tesla's energy storage battery business**.
- Tesla may fail to cash in on the EV market it has pioneered, projected to grow at a 33% CAGR, but may instead succeed as **an energy innovation company**.
- Tesla does not disclose an environmental programme for its suppliers, which **could negatively impact its ability to source lithium** through its supply chain.

Stock price performance
Tesla vs. Nasdaq, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
Renault	79	78	83	77
BMW	78	77	87	71
Nissan	66	73	61	58
GM	59	55	54	71
Tesla Motors	57	62	50	55

Source: Sustainalytics

Overview

Two milestone events occurred in 2015 that should make 2016 a defining year for the automobile industry. The Paris Agreement, which puts forward a framework for countries to pursue national emission reduction strategies, and VW's "dieselgate" emissions scandal, have drawn attention to the unsustainable nature of fossil fuel-based mobility over the long run. These developments have galvanized the industry to focus on developing more sustainable mobility options and have sped up the timetable for electric mobility investments, coupled with an energy transition towards renewables. For Tesla, long positioned at the vanguard of electric mobility, we see both new challenges and new opportunities in 2016.

The Gigafactory, scheduled to open later this year, is an essential milestone for Tesla and will allow the company to increase capacity and scale up battery production for its vehicles and energy storage applications. Located in the Nevada desert, the factory will be one of the biggest buildings on the planet, and it will be carbon neutral.

As the electric vehicle (EV) market grows and becomes increasingly competitive, Tesla may find it harder to race with established carmakers on mainstreaming electric vehicles and with innovative start-ups that want to challenge its leadership. Yet, Tesla is anything but a traditional automaker, and the company's management envisions a future of clean energy beyond mobility. Tesla's future profits are closely tied to its investments in energy storage, including the recently launched Powerwall and Powerpack products. Tesla is evolving rapidly, exploring untravelled roads and creating new opportunities for its own success and long-term value creation beyond conventional boundaries.

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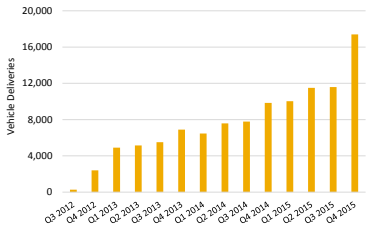
Tesla and the EV market

Tesla disrupted the established competitive paradigm

Tesla represents a unique case in the automobile industry. A start-up company founded in 2003 by visionary and charismatic entrepreneur Elon Musk, who believed it "would almost certainly fail", Tesla broke through an industry dominated by global mega-players and disrupted established competitive paradigms, with a primary objective of accelerating the mainstream adoption of sustainable transport. To this end, in June 2014 Musk announced Tesla would make all of its patents freely available.

Tesla's Vehicle Deliveries



Source: Tesla

After decades of undisputed domination by the internal combustion engine, EVs, comprising battery electric vehicles and hybrids, have gained momentum, spurred by innovation, government intervention and consumers' interest. Although still accounting for less than 1% of global market share, the EV market has shown steady growth in recent years. Over the next 10 years, sales of EVs are forecasted by Goldman Sachs to grow almost 33% yearly, with hybrid and electric vehicles projected to account for almost one quarter of global vehicles sales in 2025. As shown in the chart to the left, Tesla's vehicle deliveries have increased from less than 300 in Q3 2012 to over 17,000 in Q4 2015.

The effect of low oil prices

Opinions are divided about the extent to which low oil prices will curtail demand for EVs. Conventional wisdom is that low oil and fuel prices put downward pressure on consumer demand for EVs and hybrids, and there is certainly some evidence to support this claim, with some industry bodies in the US already warning that aggregate 2015 sales of EVs may be significantly lower than in 2014. But it is also important to understand the demand drivers – early EV adopters tend to be highly motivated by the prestige factor associated with owning a disruptive technology, and may be less sensitive to shifts in fuel prices than assumed. However, as the market for EVs matures, we expect that cost will play a more central role in the decision-making of prospective customers.

Tesla Energy, the Gigafactory and Model 3

Moving from niche manufacturer to mainstream supplier

Tesla follows a top-down strategic marketing approach: it started as a niche manufacturer of luxury, high-performing cars for affluent early adopters to build acceptance and recognition for EVs, to gradually move to the mainstream market with more affordable vehicles in the near future, and to stimulate other carmakers to invest in developing and advancing EV technologies, which will help achieve the "mainstreaming" of EVs for consumers.

2015, the year of the Model X and Tesla Energy

After the Tesla Roadster and the Model S, in 2015 the company delivered the first Model X and launched Tesla Energy, its new business for stationary storage solutions for households, businesses and utilities. Its first product, Powerwall, is a home battery that can store electricity and benefit households in terms of load shifting, increased self-consumption of solar power, and backup solutions. A second product, Powerpack, is an equivalent system for businesses and utilities, and helps to maximize on-site consumption of clean power, peak shaving, increased demand response and smart grid solutions. Utility partners include American AES Corporation and Southern

California Edison, as well as Origin Energy in Australia (see our Origin story on p. 49) and Vector in New Zealand.

2016, the year of the Gigafactory and the Model 3

For 2016, Tesla has announced the kick-off of the Gigafactory and the unveiling of the Model 3, its first mass-market vehicle, priced at a relatively affordable USD 35,000. Located near Reno, Nevada, Tesla's Gigafactory will be one of the biggest buildings on earth, encompassing 14 million square feet. Construction for the factory broke ground in 2014, and the plant is expected to attain full production capacity in 2020 through a total investment of USD 4–5bn. The Gigafactory will be the production hub for the battery packs for Tesla's vehicles as well as its stationary storage applications, in an integrated production process from raw materials to final batteries. The Gigafactory is a milestone for the company and is instrumental to achieve Tesla's target of producing 500,000 vehicles per year by 2020, as well as expanding production for its energy storage applications.

Litihum sourcing means new supply chain issues

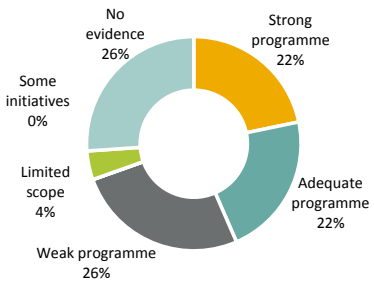
Supply chain is a critical aspect

A crucial point is whether the company will be able to sustain its production plans from the most basic factor, lithium sourcing. Ensuring a continuous, seamless and affordable supply of lithium is vital: the mineral is one of the hottest commodities, and its demand is projected to grow steadily in the coming years as countries and corporates rush to secure supplies. In addition, lithium sourcing needs to be done in a responsible way to stand by Tesla's commitment to advance sustainability.

New partnerships and challenges for lithium supply

Tesla has signed agreements with Pure Energy for lithium supplied from its Brine Project in Clayton Valley, Nevada, and with Bacanora Minerals and Rare Earth Minerals, which have projects under development in Mexico. The extraction and production of lithium have significant environmental and social impacts in terms of water pollution and depletion, air contamination, ecological toxicity, adverse effects on human health and potential labour issues, such as undocumented workers illegally employed in mines.

Supplier Environmental Programmes (E.2.1.1)



Source: Sustainalytics

Tesla's decision to source the mineral from the US and Mexico, where legislation is stronger than in other lithium-producing countries in South America and Asia, goes in the right direction. However, Nevada was named a "Natural Disaster Area" by the US Department of Agriculture because of water issues, and the state has one of the largest percentage of undocumented immigrants in the US. Therefore, the company needs strong supply chain management and standards to ensure successful and responsible business practices from its partners. But, as shown in the chart to the left, Tesla is one of 26% of analyzed auto companies that fail to disclose any type of environmental programme for suppliers. Tesla is a member of the Conflict Free Sourcing Initiative for conflict minerals, but is not part of the broader Electronic Industry Citizenship Coalition for responsible supply chains in the electronics industry.

Tesla's leadership on carbon

Tesla has articulated a sophisticated approach to clean mobility

In addition to supply chain monitoring, emissions management stands out as a major sustainability issue for auto companies. In our view, Tesla has demonstrated an innovative approach to carbon management, although the company discloses less performance information than many of its peers. Tesla stands out among automakers for its overarching approach to clean mobility. Life cycle or "cradle-to-grave" impact assessments show that the usage phase accounts for more than 90% of emissions from ICEs, 91% for hybrids and 69% for BEVs, depending on the regional energy mix. Therefore, EVs' sustainability depends on their electricity sources, and EVs are often criticized as merely outsourcing their emissions to power plants using dirty fossil fuels.

Working towards carbon neutrality

To address this issue, Tesla has partnered with SolarCity to install solar panels on consumers' roofs so that users can charge their vehicles at home using renewable energy. Moreover, Tesla's Supercharger network of roughly 600 stations provides free on-the-road charging throughout the US, Europe and Asia. The company is working towards carbon neutrality for the whole network and increasingly powers charging stations from renewable energy.

Outlook – Long-term value creation, but in what sphere?

Investors have been patient

Tesla's goal is not so much about making a profit and paying out dividends in the short term – on the contrary, the company will likely need to raise more capital, perhaps issuing more stock. Tesla posted a net loss in the past 10 quarters, but investors have thus far accepted these losses, balancing them against Tesla's exponential revenue growth and innovation on electric mobility and energy storage.

The "missing piece" to help renewable generation reach scale

Tesla may end up being confined as a niche player in the EV market it has so tenaciously created, but we expect the company's future success lies in energy storage. Tesla's Powerwalls and Powerpacks might prove to be the company's best-selling and profitable products. Utilities and retail customers are paying increased attention to energy management and green power, but are challenged with the fundamental issues of responding to demand fluctuation and peaks, and coping with renewables' volatility. Tesla Energy's products have the potential to serve as "the missing piece" for scaling up renewable power generation.

Carbon leadership adds value, but more work needed on supplier programmes

While our analysis shows that Tesla could benefit from more advanced programmes on supplier environmental programmes, particularly in the context of securing future lithium supplies, Tesla's leadership on carbon issues is consistent with the company's value proposition, and the company is well positioned to benefit in an economy that is slowly inching towards carbon constraints.

Borregaard

Bio-based chemicals in a carbon-constrained world

62 — **Overall ESG Score**: Average Performer

70 out of 165 — **Relative Position**: Fourth decile

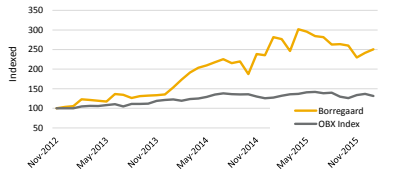
0 — **Highest Controversy Level**: No evidence

Domicile: Norway
Industry: Chemicals
Ticker: BRG (OSE)
ISIN: NO0010657505
Employees: 1,080
MCap (USD m): 509*
** as of Dec. 31/2015*

Key insights

- The Paris Agreement could further enhance growth in the bio-based chemicals market, which is estimated **to grow 90% between 2008 and 2020** in the EU.
- Borregaard offers wood-based chemicals and is **well positioned to thrive in this market**, combining focused R&D experience with economies of scale in production.
- Recognizing that deforestation is a major source of carbon dioxide, Borregaard **procures 86% of its wood supply from PEFC-certified forests**.

Stock price performance
Borregaard vs. OBX, 2012–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
Borregaard	62	58	55	73
Samsung Fine Chemicals	60	61	64	51
TSRC Corporation	59	57	54	69
China Petrochemical Dvlp.	51	40	59	60
Rayonier	49	42	49	60

Source: Sustainalytics

Overview

Borregaard is well positioned to compete in a post-COP21 world, as implementation programmes put forward by parties to the agreement are likely to drive increased demand for low-carbon alternatives to petrochemical products. Borregaard, which offers direct bio-based substitutes for more carbon-intensive petrochemical products, has the strategic focus and operational competencies to gain a stronger foothold in this market. The company can produce new products competitively, due to its focused R&D approach on wood, and has the ability to achieve economies of scale through its large and advanced biorefinery. Moreover, the company adequately manages the carbon risks related to its reliance on wood as a key resource input.

Bio-based chemicals – Branching out

Part of the solution to holding the increase in global temperatures to below 2° C above pre-industrial levels (one of the overarching goals of the Paris Agreement) lies in replacing carbon-intensive fuels with renewable or low-carbon fuels. Fuel switching is clearly a complex transition, but carbon constraints implemented by governments as a follow-up to the Paris deal may hasten this shift by making renewable fuels more price competitive. A broad-based shift to alternative fuels can have a significant impact on the petrochemical industry, which derives chemicals from petroleum and natural gas, and produces materials that are used in a wide range of products, including lubricants, catalysts and food additives. Although essentially business-to-business (B2B), the final products often end up in consumer markets.

Demand from B2B and consumer markets for sustainable alternatives to carbon-intensive petrochemical products is already rising. A September 2010 report prepared by the BIOCHEM project and co-financed by the European Commission forecasted

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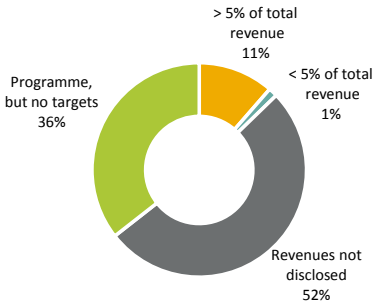
strong market growth for several bio-based chemicals derived mainly or partly from biomass feedstocks. In the European Union (EU), this market is estimated to grow from EUR 21bn to EUR 40bn between 2008 and 2020, an increase of more than 90% or 5.3% per annum. This would imply that by 2020, the share of bio-based chemicals of the total chemical market will grow from 4% to 6% in the EU. The share in the US market is already significantly higher, estimated to be 10% by the United States Department of Agriculture (USDA).

Sustainable Products & Services (E.3.1.1)



Source: Sustainalytics

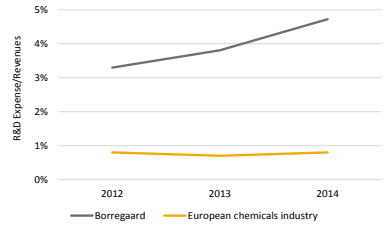
Borregaard can take advantage of this market growth, as the company offers sustainable bio-based substitutes for a wide range of petrochemical products, deriving 48% and 37% of operating revenues in FY 2014 from performance chemicals and specialty celluloses, respectively. Of the company's remaining revenues, 8% is derived from vanillin products, most of which are made out of wood. Sustainalytics' data indicates that the company is among the industry leaders in terms of providing sustainable products. As shown in the chart to the left, Borregaard is one of only 19 out of 165 chemicals companies (11%) disclosing a product portfolio the comprises more than 5% sustainable products by revenue. This includes almost the entire Borregaard product portfolio, as close to all of its performance chemicals, specialty celluloses and vanillins are bio-based and hence provide alternatives to less sustainable traditional petrochemical products.

Crude oil is a key cost driver of petrochemicals

It is of course important to factor in the effect of low oil prices, which can have significant demand effects for low-carbon products. In the case of petrochemicals, crude oil is a key cost driver, and conventional petrochemical producers are expected to benefit from the current market environment of low oil prices. However, oil price dependence is a double-edged sword, as feedstock costs for petrochemicals are likely to increase in a rising oil price environment. From this perspective, independence from oil prices is a strategic advantage for bio-based chemical producers like Borregaard, which are less exposed to increasingly volatile fossil fuel prices.

Strong roots for sustainable growth

Comparative R&D Analysis, 2012–2014



Source: Strategy&, Borregaard

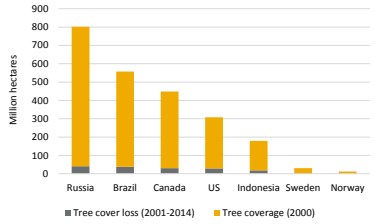
The company's almost exclusive use of wood instead of oil and gas in its production process comes with carbon-related opportunities and risks. On the opportunity side, Borregaard's narrow focus on wood enables focused R&D investments to create new and more sustainable alternatives for traditional petrochemical products. In 2014, the company invested around 5% of its revenues in the development of such products, significantly higher than the industry average in the same year, which was less than 1%, according to consultants at Strategy&.

The company has successfully translated these investments into new products, as 15% of its revenues in 2014 were derived from "new products", which are offered in various markets. These include agriculture, construction and automotive (lignins), pharmaceuticals and bioethanol (celluloses). Furthermore, Borregaard can couple its focused investments with economies of scale in production, as it operates one of the world's largest and most advanced biorefineries in its home country, Norway.

Borregaard sources 86% of its wood from low-risk forests

Its dependence on wood also exposes Borregaard to related risks. First, the company needs to ensure a consistent supply of wood in order to maintain operations. Here, Borregaard manages to reduce the logistic complexity and risk of supply chain disruptions by sourcing wood solely from Norway and Sweden (86% and 14%, respectively), in close proximity to its Norwegian biorefinery.

Tree cover loss and coverage by country



Source: Global Forest Watch

Second, this wood needs to be sustainably sourced, as agricultural emissions, which include emissions from deforestation and land use, account for 24% of global GHG emissions (as discussed on p. 16 above). Forests that are sustainably managed typically suffer less deforestation. While future climate change regulations could curb wood production and therefore disrupt Borregaard's supply chain, the company adequately manages its exposure to this risk. For instance, it does not procure wood from high-risk areas such as Brazil and Indonesia, and requires its Norwegian suppliers to supply wood in accordance with the Programme for the Endorsement of Forest Certification (PEFC) standard for silviculture and biodiversity. Borregaard could further expand these requirements to its suppliers from Sweden, which is more prone to deforestation risks. As shown in the table to the left, Sweden has endured modest tree cover loss over the past few years from an absolute perspective, but as a percentage of the country's total tree coverage, the loss has been significant, at about 11%.

Borregaard is reducing its reliance on wood

Recognizing these opportunities and risks, the company is mitigating its reliance on wood by exploring other biomass materials. In feedback provided by Borregaard to Sustainalytics, the company provided the example of its BALI concept, which is designed to make high-quality lignin from other types of raw material, such as agricultural waste products like bagasse from sugar cane. Although the concept is still to be commercialized, this shows that Borregaard is reducing its reliance on wood and expanding its knowledge of bio-based chemicals to other biomass materials.

Outlook – Turning over a new leaf

Demand for Borregaard's bio-based chemicals will continue to grow

A carbon-constrained world could require a fundamental strategic re-think in many industries and may require management and owners to turn over a new leaf in their approach to emissions management and low-carbon upside opportunities. We expect that Borregaard may prosper in such a world and create positive value for shareholders. With the results of the Paris Agreement and the continuous drive towards sustainable alternatives for petrochemical applications in almost all global industries, we expect that the demand for Borregaard's bio-based chemicals will continue to grow. Borregaard is well positioned to capitalize on this growth through a combination of focused and extensive R&D investments, economies of scale in production, and adequate management of carbon risks related to deforestation.

LG Chem

Sustainable opportunities in the battery market

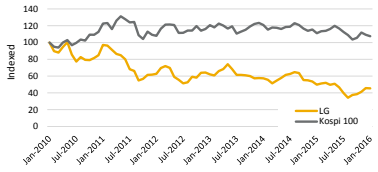
65	48 out of 165	3
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Average Performer	Third decile	Health & Safety

Domicile: South Korea
Industry: Chemicals
Ticker: A051910 (KRX)
ISIN: KR7051910008
Employees: 24,928
MCap (USD m): 16,142*
** as of Dec. 31/2015*

Key insights

- LG Chem's broad client pool and manufacturing base should bring **big opportunities in the electric vehicle battery market** from 2016 onward.
- LG Chem recently signed a deal with AES, a leading US energy storage company, to supply **1 GWh worth of batteries** (enough to power 90m cellphones).
- LG shows a **strong commitment to carbon reduction** within its own operations, but supply chain monitoring may be an area of concern.

Stock price performance
LG Chem vs. Kospi 100, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
BASF	74	67	77	81
Dow Chemical	67	69	61	73
LG Chem	65	67	62	64
Mitsubishi Chemical	64	62	68	64
CF Industries Holdings	46	35	47	62

Source: Sustainalytics

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Overview

The energy and transport sectors are significant contributors to global emissions, accounting for 35% and 14% respectively, according to the IPCC. Electric vehicles and renewable energy – solar PV and wind in particular – are attracting a disproportionate share of the market buzz, partly because of their improving fundamentals and partly because of the sheer scale of their carbon reduction potential. Though 73% of LG Chem's business comes from petrochemicals manufacturing, which is energy intensive and not particularly conducive to emissions reduction, LG Chem stands out through its lithium-ion battery business and as a provider of backbone technologies to both the EV and renewable energy industries.

LG Chem is well positioned to drive improvements for electric vehicles in battery run-time, quality and price. The company currently supplies batteries to over 20 companies, including the top three carmakers in China (Changan Automobile, Great Wall Motors and Dongfeng Motor) and many of the top 20 carmakers globally. The company aims to manufacture in three continents by 2017, with plans to add manufacturing facilities in Poland in addition to current facilities in China, Korea and the US.

Additionally, LG Chem is a leading player in the energy storage system (ESS) market, which can boost the effectiveness of renewables by storing renewable energy for on-demand use. The company is partnering with AES, one of the biggest companies in the sector, to expand its share of the ESS market. Although LG Chem's main businesses, chemicals and materials, are fluctuating because of the low oil price and the Chinese economic downturn, we have an optimistic view of the company's battery and ESS competencies, as well as its commitment to carbon reduction within its own operations.

Success of electric vehicles depends on batteries

LG Chem is distinguished from its peers by its broad client base

LG Chem first developed the lithium-ion battery in 1999, and is currently one of the world's largest manufacturers of lithium-ion batteries, which have applications in battery-powered gardening tools, mobile devices and the EV and ESS markets. The company is estimated to have a 12% share of the market for EV batteries, trailing Panasonic (39%) and AESC (21%). However, LG Chem stands out from its Japan-based competitors in several respects. Panasonic provides its batteries exclusively to Tesla, and its profitability depends on Tesla's success. Similarly, AESC, as a joint venture of Nissan and NEC Crop., provides batteries exclusively to Nissan Motors. LG Chem, by contrast, is distinguished by an expansive client base, including top Chinese companies such as SAIC Motors, Dongfeng Motor and Great Wall Motors, and major automakers such as Audi, Fiat, Ford, GM, Hyundai, Peugeot, Renault, Toyota, VW and Volvo.

Positive developments for LG Chem

Recent developments give additional reasons for investors to be optimistic about LG Chem. First, the company recently launched a new factory in Nanjing, China, with a production capacity of 100,000 units per year. It is expected that this will help LG Chem access the growing Chinese market. With the addition of this factory, LG Chem now manufactures batteries in China, Korea and the US. Second, the company plans to open a new factory in Poland in 2017, to provide lower-cost and speedier access to European clients like German power supplier STEAG, for whom the company will be providing 140 MW of power storage through large-scale batteries in 2016–2017. Lastly, in October 2015, LG Chem succeeded in breaking open the exclusive partnership between Tesla and Panasonic for lithium-ion batteries, as Tesla began purchasing LG Chem's batteries for upgrades to the Roadster, Tesla's first model in the market, which may develop into further opportunities for LG Chem as Tesla expands.

Renewable energy calls for a storage system

ESS technologies address the intermittency problem

Lithium-ion batteries can help businesses and utilities address solar and wind's great intermittency challenge (solar and wind power are only available when the sun is shining or the wind is blowing, which can create load management challenges for utilities and unstable power generation). To overcome this limitation, many electric equipment, electronics, chemicals and utility companies have developed ESS technologies. ESS is used to stabilize the energy supply and reduce energy usage costs, as utilities can deploy stored electricity during peak hours.

The ESS market is expected to grow at a CAGR of 14% from 2016–2020

The ESS market is poised to experience the same type of exponential growth that characterized solar PV in the mid-2000s (although, by most definitions, the growth curve for solar PV is still steep). The global ESS market is forecasted to grow at a CAGR of 14% from 2016–2020, although growth is expected to be considerably higher in specific markets. In the US, for instance, the energy storage market was expected to add over 200 megawatts in 2015, up 250% from 2014.

The largest lithium-ion battery supply deal in history

LG Chem's dominant positioning in the lithium-ion battery market should help the company capture a large part of the forecasted growth in the ESS market. In December, LG Chem stunned the industry when it signed a deal to provide approximately one gigawatt hour's (GWh) worth of lithium-ion batteries to Virginia-based AES, one of the world's largest energy storage companies. The deal will see LG Chem provide batteries for AES' battery farms through 2020. To put this order in perspective, the order amount (1 GWh) is enough to power approximately 90 million cellphones, and is larger than the sum of the world' current energy storage systems (917 MWh), according to the US Energy Information Administration. Thus, LG Chem's batteries will be attached directly to power grids, with the possibility of further expansion as the international demand for energy storage continues to grow.

Opportunity but also risk from the low oil price

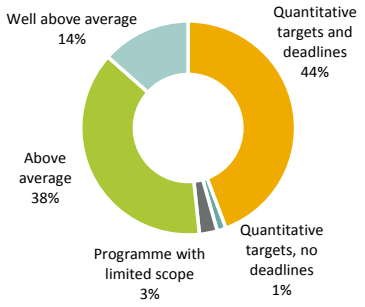
Low oil prices increase petrochemical spreads such as ethylene-naphtha and PE-naphtha, which are closely tied to LG Chem's profitability

Though we expect no significant impacts on the company's EV and ESS businesses from the low oil price, there may be impacts on the LG Chem's petrochemicals business. To a certain extent, LG Chem benefits from low oil prices, as naphtha, a petroleum derivative, is a major input in many of the company's petrochemical products, particularly ethylene and other downstream products. About 73% of LG Chem's revenue comes from the materials & chemicals business unit, which produces petrochemical products such as polyethylene (PE), acrylonitrile butadiene styrene (ABS), polypropylene (PP) and ethylene. The low oil price has increased the ethylene-naphtha and PE-naphtha spreads, for example, which effectively determine LG Chem's profit margin.[50] The widening of the spreads led to increasing operating income in 2015, even though total sales were less than in 2014.

At the same time, the current economic downturn may reduce demand for petrochemical products and may put downward pressure on prices and LG Chem's revenues. This risk is particularly significant for LG Chem, as China is one of its major markets, and the country has been among the most affected by the current global economic downturn. The company has already signalled that it is looking in other directions for its business growth, as it recently abandoned plans to build a new petrochemicals facility in Kazakhstan.

LG's focus on energy efficiency

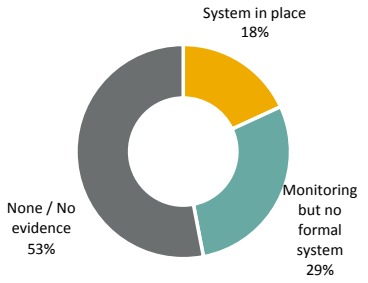
GHG Reduction Programmes (E.1.7)



Source: Sustainalytics

Within its own operations, LG Chem has set a carbon reduction target of 23% compared to its estimated emissions by 2020. The company has implemented an ESS at several of its facilities, and a waste heat recovery system to optimize steam use and conserve energy. LG Chem is one of 74 out of 165 analyzed chemical companies (44%) assessed as having a strong GHG reduction programme with targets and deadlines (see graph at left), and one of only 41 out of 165 (25%) considered to have strong GHG reporting. Both the company's absolute emissions as well as its carbon intensity declined from 2013 to 2014, demonstrating the company's commitment to reducing its own energy use and emissions. LG Chem's focus on energy efficiency should help the company contain energy-related costs as it expands its facilities.

Supply Chain Monitoring (S.2.2)



Source: Sustainalytics

An area of growing concern for LG Chem may be supply chain monitoring. A recent Amnesty Report identified a number of companies, including LG Chem, for failing to prevent child labour among their cobalt suppliers. Cobalt is a key ingredient for lithium-ion batteries, and approximately 75% of the world's cobalt is mined in the Democratic Republic of the Congo. LG Chem does not yet report a formal supply chain monitoring system, and therefore lags behind the 18% of chemical industry peers demonstrating best practice on this issue (see chart at left). However, LG Chem has taken steps to strengthen its management of conflict minerals. Investors are encouraged to engage with the company on the steps it is currently taking to monitor labour conditions within its supply chain.

Outlook – Fortune from new markets, risks from the old

We expect that LG Chem's promising EV Battery and ESS businesses will enable the company to deliver increasing value in the years ahead, while contributing to reduced GHG emissions globally. LG Chem's major investments in China have been completed, and the company has developed promising relationships with Tesla and AES, as well as many other businesses. Unlike its competitors, LG Chem has a broad client pool in different regions, and has established a manufacturing centre in each region that further reduces its logistics and operational costs. Yet, its biggest business unit, the chemicals business, is vulnerable to the oil price and China's economic downturn. We expect that LG will increase its focus on energy solutions with carbon reduction benefits, which are promising and show more growth potential, while de-emphasizing its traditional petrochemicals business.

Kellogg

Bold moves to address climate risks

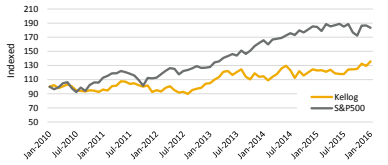
71	28 out of 208	2
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Outperformer	Second decile	Labour Relations

Domicile: United States
Industry: Food Products
Ticker: K (NYSE)
ISIN: US4878361082
Employees: 129,790
MCap (USD m): 23,475*
** as of Dec. 31/2015*

Key insights

- According to the IPCC, global food prices could increase by as much as 84% by 2050 due to climate impacts, putting **upward pressure on procurement costs**.
- The physical impacts of climate change are **already being felt by farmers and food companies**, and risks will exacerbate as temperatures continue to rise.
- Kellogg is managing its risk exposure by setting aggressive emissions reduction targets and improving **climate resilience in its supply chain**.

Stock price performance
Kellogg vs. S&P 500, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
PepsiCo	74	71	73	82
Mondelez	73	76	75	65
Nestle	73	74	69	78
General Mills	72	74	69	74
Kellogg	71	75	69	77

Source: Sustainalytics

Analyst
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Overview

The agriculture industry is uniquely exposed to risks from climate change. On the one hand, it is a significant source of global GHG emissions. As discussed in the previous chapter (see p. 16), Agriculture, Forestry and Other Land Use, an industry classification used by the IPCC, accounts for approximately 24% of global emissions, trailing only the Energy sector. Emissions are generated from a variety of different sources, including livestock, cultivation of crops and deforestation. On the other hand, the agriculture industry is severely exposed to the physical impacts of climate change. Climate change is expected to alter underlying climatic conditions, disrupting agricultural systems that have been optimized over centuries. The business of food production is likely to be increasingly unpredictable, particularly in the absence of climate change strategies that address issues from farm to fork.

As a company whose sales and growth prospects are wholly reliant on agricultural inputs, Kellogg has long recognized the risks posed by climate change. The company's value chain has suffered from eight food price shocks brought on by extreme weather events since 1990, and recent research predicts that global wheat yields may fall by as much as 6% for every 1° C increase in temperature.

While Kellogg has been criticized in the past for taking insufficient action regarding carbon reduction, much of the criticism was replaced by praise when the company released the details of its ambitious climate change plan in December 2015. Kellogg has made a commitment to reduce its Scope 1 and 2 emissions in absolute terms by 65% by 2050, against a 2015 baseline, and to reduce Scope 3 supply chain emissions by 50% during the same time frame. Furthermore, Kellogg has an adaptation plan in place that seeks to build climate change resilience in its supply chain.

Climate change is already happening

Threat to the bottom line

The increasing volatility of commodity prices, driven in part by the physical effects of climate change, is a threat to Kellogg's bottom line. The company's value chain has suffered from eight food price shocks brought on by extreme weather events since 1990. For example, in 2007 and 2008 global prices for some grains and vegetable oils rose more than 60% above historic levels in connection with adverse weather events in 2006 and 2007. More recently, 2010 heat waves in Russia, and a subsequent wheat export ban, caused global wheat prices to double. A drought in the American Midwest in 2012 caused maize and soybean prices to reach record highs. Kellogg uses derivatives to hedge its exposure to commodity price risk, but the growing volatility of commodity prices can create unfavourable impacts on Kellogg's earnings.

IPCC predicts increases in global food prices

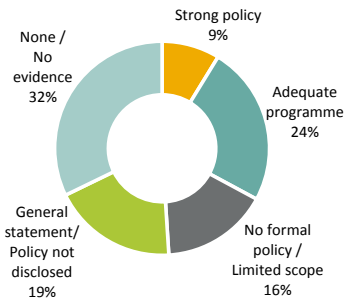
The IPCC estimates that global food prices could increase by as much as 84% by 2050 due to changes in temperature and precipitation. Similarly, research conducted by the Agricultural & Biological Engineering Department at the University of Florida found that global wheat yields may fall by as much as 6% for every 1° C increase in temperature. Rising prices for agricultural commodities will impact procurement costs for Kellogg and its peers, with knock-on-effects for product pricing and sales. Oxfam, in a study of global food companies, claimed that climate change could raise the retail price of iconic Kellogg products Frosted Flakes and Corn Flakes by 15% and 22%, respectively, in the US and even more in the UK, bringing increased pressure for Kellogg, which Oxfam dubbed a "climate laggard", to step up its commitments to sustainable agriculture.

A bold approach

Plan to reduce Scope 3 emissions by 50%

Kellogg announced bold steps towards mitigation and adaptation during 2014 and 2015, to manage both the regulatory and physical risks associated with climate change. On the mitigation side, Kellogg has set a 2050 target to reduce absolute Scope 1 and 2 GHG emissions by 65%, and Scope 3 emissions by 50%, measured against a 2015 baseline. Kellogg has set these targets to align with scientific measures of decarbonization required to limit global warming to less than an increase of 2° C above pre-industrial levels. The company has developed a roadmap for achieving these targets that includes investments in energy efficiency, low-carbon energy, transportation and distribution technologies, and network optimization.

Green Procurement Policy (E.2.1)

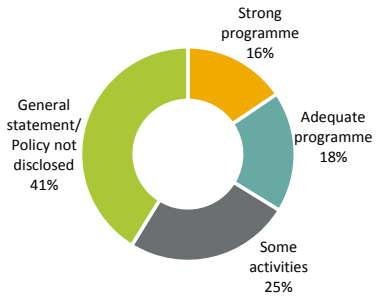


Source: Sustainalytics

Through its Scope 3 target of halving supply chain emissions by 50% by 2050, with an interim goal of 20% by 2030, Kellogg is also working towards limiting exposure to climate change regulations that could impact activities upstream of its operations, most importantly in agriculture. As one of the 10 largest food companies globally, Kellogg's supply chain target sends a clear signal to the market that agricultural producers must reign in carbon emissions to satisfy the procurement departments of their clients. Part of Kellogg's plan for accomplishing this goal includes the expansion of CDP supply chain participation, which would require suppliers to disclose a range of carbon emissions information and data, to at least 75% of tier 1 suppliers by 2020. We believe that transparency of supply chain emissions, activities and progress will be significantly increased by this expansion, leading to greater accountability.

Moreover, mitigation efforts in Kellogg's own operations and supply chain are likely to lead to cost savings over time through efficiency gains.

Sustainable Agriculture Programmes (E.2.1.3)



Source: Sustainalytics

Kellogg is tackling the physical impacts of climate change in cooperation with suppliers. As indicated in the charts to the left, only 9% of industry peers have a strong green procurement policy, and 16% have a strong sustainable agriculture programme. Kellogg is one of only six companies to have strong policies in both areas. Through programmes that promote sustainable agricultural practices in its 10 key agricultural commodities, such as fertilizer optimization, water efficiency and soil health, as well as support for smallholder farmers through research and training on climate smart agriculture, the company is making strides towards a supply chain that is more resilient to climate change. While many companies have such programmes in place, we believe that Kellogg will take a more active role towards building resilience in its supply chain, given that it has also set quantitative targets for mitigation of Scope 3 emissions, demonstrating a more holistic approach to supply chain issues, which most of its peers have yet to do.

Outlook – Prepared for the challenges ahead

Strong climate change initiatives may generate value beyond regulatory and physical impact risks

For food companies, the road ahead will be challenging. The industry is already feeling the impacts of less predictable and more severe weather events on the price and availability of quality ingredients, and more disruption may be in store. Yet in our view, Kellogg is positioning itself ahead of the curve. By setting science-based mitigation targets and driving climate adaptation in its supply chain, the company is limiting exposure in its value chain to the challenges of the future. We believe that these actions will have a trifecta of benefits for the company, providing it with a competitive edge in the face of climate change risks, generating general costs savings through increased efficiencies, and yielding reputational dividends in the context of increasing consumer demand for sustainable products.

L'Oreal

Beautifying carbon reduction

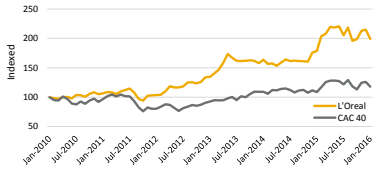
79	5 out of 39	3
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Outperformer	Second decile	Anti-Competitive Practices

Domicile: France
Industry: Household Products
Ticker: OR (ENXTPA)
ISIN: FR0000120321
Employees: 78,611
MCap (USD m): 85,204*
** as of Dec. 31/2015*

Key insights

- Weather events are putting pressure on L'Oreal's ability to source plant-based ingredients, which make up **34% of the company's raw material inputs**.
- The firm has staked out an industry leadership position on climate change and aims **to become "carbon balanced" by 2020**.
- L'Oreal's ahead-of-the-curve climate change strategy **may enhance its brand value**, drive innovation and lower future compliance costs.

Stock price performance
L'Oreal vs. CAC 40, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
L'Oreal	79	83	80	71
Procter & Gamble	71	73	71	67
Unilever	71	73	60	85
Colgate-Palmolive	67	73	62	65
Estee Lauder	67	70	70	57

Source: Sustainalytics

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Overview

Though L'Oreal has a comparatively small emissions footprint, the company is exposed to the physical and market impacts of climate change in a variety of different ways. Weather events, for instance, are affecting the company's ability to obtain key natural ingredients (34% of L'Oreal's raw ingredients are plant based). L'Oreal has embedded carbon reduction within its business model and reduced absolute emissions across its footprint of 43 plants and 153 distribution centres by 50% over the past decade. This reduction has been achieved by **(1)** transforming sourcing programmes into low-carbon models (including improving energy efficiency in the supply chains, as well as promoting productive low-carbon agricultural practices and sustainable forest management); **(2)** increasing energy efficiency in its operations by implementing sustainable building standards, such as Leadership in Energy and Environmental Design (LEED); and **(3)** integrating lower-emission transport options, such as electric cars.

The company is also exploring how leadership on climate change can enhance its brand – the world's strongest in the cosmetics industry – and appeal to consumers. In January 2016, L'Oreal named famous US actress and activist Susan Sarandon – who has vocally pushed President Barack Obama for more US action on climate change – as its new brand ambassador.

L'Oreal has also indicated that it will aim to become "carbon balanced" (achieving a balance between carbon emissions and carbon capture) by 2020. L'Oreal asserts that it can sustainably grow its business without passing on higher costs to consumers. Though we are somewhat skeptical of this claim, we see upside potential in L'Oreal's comprehensive commitment to carbon reduction throughout its value chain.

Climate change – Opportunities for beauty companies

L'Oreal already feeling the impacts of climate change

L'Oreal – the largest beauty company in the world and the second-largest household and personal products company, as measured by 2015 sales – is heavily impacted by the physical effects of climate change. The increasing frequency of extreme weather events, for example, is affecting the cost, quality and availability of many of the company's key natural ingredients (34% of L'Oreal's raw material inputs are plant based). The company's reliance on plant material – which includes palm oil, whose supply is a driver of deforestation – lends urgency to its carbon reduction efforts and makes L'Oreal's "2020 zero deforestation" commitment highly relevant for its long-term business viability.

Millennials have higher environmental expectations for cosmetics

L'Oreal, with an estimated brand value of USD 11bn (the world's most valuable cosmetics brand), sees sustainability as a core element of its marketing strategy. In its "Sharing beauty with all" campaign, L'Oreal has set a target to ensure that 100% of its products have a positive social or environmental impact, uniting its commitment to preserve "the beauty of the planet" though environmental and social initiatives with its mission to "deliver desirable and sustainable products".

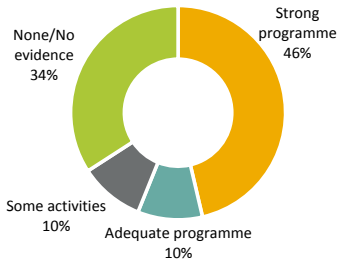
L'Oreal: A CDP participation timeline

Source: Sustainalytics

L'Oreal plans to create a product assessment tool through which consumers can access the environmental profile of the company's products, including the product's emissions footprint across the value chain. In offering green products and interacting with customers on climate-related topics, L'Oreal could build increased brand loyalty, particularly as millennials, a key customer segment, are more likely than other customer segments to expect products to be environmentally friendly and ethical. Moreover, a 2015 global online study by the research firm Nielsen found that millennials are willing to pay extra for sustainable offerings.

Like many companies, L'Oreal uses the CDP to externally communicate its climate leadership. L'Oreal was an early signatory to the CDP, joining in 2003. The company entered CDP's supply chain programme in 2007 and was named to CDP's Climate Disclosure Leadership Index (CDLI) in 2012. Additionally, the CDP has recognized L'Oreal as a top performer in the cosmetics industry by assigning L'Oreal an A rating on the Carbon Performance Leadership Index (CPLI) for the past three years.

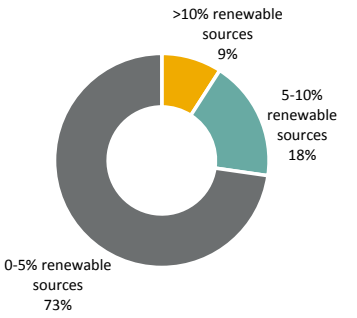
Sustainable Agriculture Programmes (E.2.1.3)



Source: Sustainalytics

With almost one third (28%) of L'Oreal's product emissions generated at the sourcing stage, the company has prioritized strong sustainable agriculture and sourcing initiatives focused on three areas: **(1)** making processing methods more energy efficient; **(2)** promoting more productive, lower-carbon farming approaches; and **(3)** managing forests sustainably, with the aim of reducing supply chain emissions by 400,000 tonnes of CO_2e by 2020. In Bolivia, for example, L'Oreal has worked with a quinoa husk supplier to introduce sustainable farming practices that make soils more effective carbon storehouses. Moreover, the company has pledged to source 100% of its renewable raw materials from sustainable sources, including deforestation-free palm oil. As shown in the chart to the left, L'Oreal is one of 19 out of 41 (46%) analyzed household products companies that have a strong sustainable agriculture programme.

Renewable Energy Use (E.1.11)



Source: Sustainalytics

Though the majority (53%) of companies in the global household products industry have established comprehensive programmes to reduce GHG emissions, L'Oreal is one of only a few analyzed companies in the industry (9%) that has a strong renewable energy use programme, which we define as a programme that supplies more than 10% of a company's energy needs from renewable sources. L'Oreal reports that renewable energy accounted for 30% of the firm's total energy use in 2014. Examples of the company's investments in this area include cogeneration systems and a biomass plant in Belgium; a tri-generation biomass plant in Spain that produces 20,000 megawatt hours (MWh) of thermal energy each year; heat networks in Germany and Italy; and solar PV installations in China, the US and Spain.

Becoming carbon neutral by 2020

These efforts have allowed L'Oreal to cut its absolute GHG emissions in half over the past decade. Five plants in Spain, Belgium, France, Italy and China and three distribution centers in Australia, Mexico and the US reached carbon neutrality in 2015. The firm has extended its CO_2 emission reduction commitment in 2015, pledging to further lower its CO_2 emissions an additional 10% compared to a 2005 baseline, with the intent of becoming "carbon balanced" by 2020. L'Oreal aims to achieve its new ambitious target through increased cooperation with raw material suppliers. Such cooperative efforts include sustainable agriculture programmes in Burkina Faso and Indonesia.

Impact on company value

L'Oreal's comprehensive climate change strategy may enhance its brand value

We are optimistic about L'Oreal's climate change strategy and believe that the company's ambitious new targets for 2020 could generate both reputational and bottom-line benefits. A key question for L'Oreal (and, indeed, for companies across the industry) is whether consumers will pay more for "green" cosmetics products. L'Oreal's CEO Jean-Paul Agon acknowledged this difficulty in December 2015, when he stated that, "[Consumers] want to buy green but not at a more expensive price." Though most consumers are unlikely to pay a premium for L'Oreal's green products, there is evidence that millennials will pay more for products and services that come from companies committed to positive social and environmental impact. As such, L'Oreal has the opportunity to carve out a decisive share of the green products market among young women (who are the main customers of L'Oreal's beauty products).

Green products and competitive differentiation

Since the firm estimates that 70% of consumers of the company's products are researching online before buying, and the term "beauty" is one of the most Googled topics in the world (about four billion searches a year), the "green" online image of L'Oreal and digital marketing are highly important to attract customers, and could be a key factor for competitive differentiation and increased brand loyalty. L'Oreal is planning to leverage its climate-friendly sustainability into a selling point as it interacts with consumers digitally.

Reducing future compliance costs

The emission reduction strategies that L'Oreal has implemented since it joined the CDP in 2003, including the promotion of productive low-carbon agricultural practices and forest management projects in the supply chain, the implementation of sustainable building standards such as LEED, and the integration of lower-emission transport options, could help L'Oreal reduce compliance costs in a tightening regulatory environment, as implied by the national commitments (INDCs) made under the Paris agreement.

Employee engagement on climate change could offer operational efficiency gains

There is a final aspect to L'Oreal's climate change strategy which, in our view, has not yet been fully considered. L'Oreal conducts strong employee engagement on climate change, calling on employees across all levels and functions to contribute innovative sustainable product solutions (with environmental and social benefits) and hosting an annual internal innovation competition on sustainability since 2009. This could maximize opportunities related to increased employee motivation and associated operational efficiency gains.

Outlook – Industry leading position creates value

Favourable reputational and brand effects

We believe that L'Oreal's robust climate change strategy will have a long-term positive impact on the company's financial performance. L'Oreal's pioneering climate change programmes and digital interactions with consumers could have favourable reputational and brand effects, accelerated by increased overall consumer awareness about climate change following COP21. If companies like L'Oreal are able to increase brand loyalty through carbon reduction efforts, this may point the way forward for companies in other (carbon-heavier) industries. Moreover, through its leadership on climate change and its ambitious target to become "carbon balanced" by 2020, L'Oreal is well placed to avoid compliance costs associated with tightening climate change regulations. Finally, the firm can benefit from operational efficiencies that relate to increased employee motivation from involving staff in finding innovative products solutions linked to sustainability and carbon reduction.

General Electric

Promising acquisitions give a renewables boost

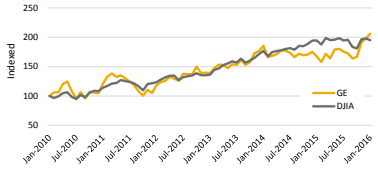
66	5 out of 56	3
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Outperformer	First decile	Quality & Safety

Domicile: United States
Industry: Industrial Conglomerates
Ticker: GE (NYSE)
ISIN: US3696041033
Employees: 305,000
MCap (USD m): 254,652*
** as of Dec. 31/2015*

Key insights

- GE's acquisition of Alstom's power business will diversify GE's renewable energy portfolio in the areas of **offshore wind, hydro, solar and tidal power**.
- A recent deal to acquire Metem Corp., a privately held turbine business, will **sharpen the company's focus on industrial manufacturing.**
- GE's "Digital Wind Farm" technology **may increase wind energy production up to 20%** by merging wind turbine technology with data analysis.

Stock price performance
GE vs. DJIA, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
3M Company	75	75	71	79
General Electric	67	60	69	77
Siemens	64	74	54	61
Honeywell International	57	51	52	69
Danaher	53	49	53	60

Source: Sustainalytics

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Overview

General Electric (GE) is one of many companies adapting its business strategy to climate change and investing in the development of energy-efficient technologies. As mentioned elsewhere in this report, renewable power is the fastest-growing segment in the power generation industry and could be given a further boost as countries pursue national emissions reduction targets through the Paris Agreement framework. For a range of different motivations, large energy-consuming countries such as China, India and the US are moving to diversify their energy mix with renewables. REN21's 2015 Renewables Global Status Report predicts that renewable energy will account for over 26% of global power generation in 2020, up from 22% in 2013.

GE is one of the world's largest industrial conglomerates and is taking aggressive steps to capitalize on these market dynamics. In November 2015, GE acquired Alstom's power and grid businesses and set up a new business unit, GE Renewable Energy. With the integration of Alstom's products and solutions, the company's renewable energy portfolio will expand to an installed base of 370 gigawatts (GW), and GE will be able to enter the offshore wind and hydro power markets. In December 2015, GE also announced plans to acquire Metem Corporation, a US supplier of super-alloy components for turbines. Acquiring Metem will enable GE to offer in-house turbine cooling technologies that help reduce emissions. GE is also exploring new iapplications for its Digital Wind Farm, a new product portfolio that integrates digital infrastructure in wind farms.

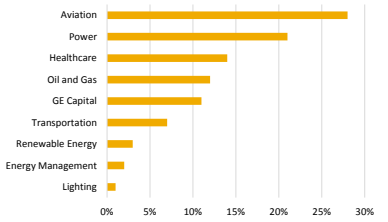
GE has a complex relationship with energy markets – the company has business units that manufacture nuclear reactors and technology for coal-fired power plants – but we expect its newly formed renewable energy segment will account for a greater share of total profit going forward.

Boosting renewables exposure through Alstom

The largest acquisition in GE's history

In November 2015, GE finalized the acquisition of Alstom's power and grid businesses for USD 10.3bn. The Alstom acquisition is the largest in GE's history and brings to the table products and services that are similar and complementary to GE's power-related product portfolio, making the company a stronger competitor in the sector. The acquisition has certainly been controversial from a human capital standpoint, as GE plans to eliminate 6,500 jobs in Europe as part of its strategy to capture USD 3bn in cost savings from the deal; however, the merger will boost GE's exposure to renewable energy markets.

Share of Operating Profit*



* First nine months of 2015 **Source**: Bloomberg

In the wake of the acquisition, GE launched a standalone renewable energy segment, GE Renewable Energy, which houses the company's pre-existing renewables business and the wind and hydro power businesses acquired from Alstom. GE Renewable Energy reports USD 9bn in revenue and, as shown in the graph to the left, accounts for approximately 3% of GE's operating profit. GE now prides itself on having "the most diverse renewable portfolio" in the sector and a worldwide presence in this field, offering onshore and offshore wind, hydro, solar and tidal technologies and services.

Alstom opens new doors to wind and hydro power markets for GE

In addition to strengthening GE's onshore wind portfolio, Alstom's technologies will open new doors in the offshore wind and hydro power market. Alstom is an important player in this market, providing offshore wind turbines and services, including the Haliade turbine technology (one of the world's largest offshore wind turbines), as well as wind control systems. The wind footprint of GE Renewable Energy consists of an estimated 30,000 turbines worldwide. Alstom's portfolio also brings 227 GW of hydro capacity to GE. GE stands to benefit strongly from cost efficiencies from economies of scale, as well as leveraging Alstom's technical expertise to drive innovation in these markets.

A pioneer in the US offshore wind market

GE plans to focus on offshore wind and solar power projects in 2016. For example, GE will provide wind turbines with the Haliade turbine technology for the Block Island Wind Farm in Rhode Island, the first offshore wind farm in the US, which is expected to start generating energy in the fall of 2016. The farm, which is intended to meet all of Block Island's energy needs, will replace an oil-fired power plant with green energy. Additionally, cables connecting the wind farm to the mainland will allow the turbines to send surplus energy back to the mainland grid. This project has received much attention, and if successfully executed, will provide GE with a first-mover advantage, competitively positioning the company for additional opportunities in the new US offshore wind market.

Improving service options

Merging with Alstom will also strengthen GE's lucrative service business. Alstom's service capabilities will increase GE's service effectiveness for its own installations as well as broaden opportunities for GE to service the turbine equipment of other manufacturers. GE has forecasted that new service sales could amount to USD 100m in 2020.

Metem brings new turbine technologies

GE brings in-house sustainable cooling technologies

GE also plans to acquire Metem Corporation, a US provider of turbine engine super-alloy components for the power generation and aerospace industries. This investment is an important step for the future growth of GE's power division, as the company will integrate new technologies for precision cooling hole manufacturing, which enable emissions reductions. As turbines function on high temperatures, the cooling technologies developed by Metem enable turbine engines to run more efficiently, which increases productivity and helps reduce emissions. The acquisition is expected to be finalized in the first quarter of 2016. It remains to be seen how GE will leverage Metem's portfolio, but it is expected that the acquisition of Metem will help GE maximize efficiency gains and competitive advantage from Alstom. We may see additional strategic acquisitions of this kind for GE in 2016, as the company attempts to strengthen its position as an efficiency solutions provider for its industrial clients.

The "Industrial Internet" – Digital Wind Farm

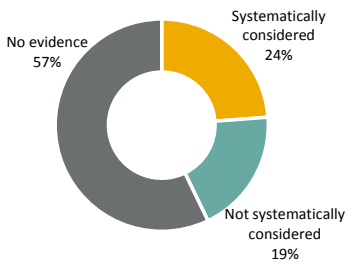
Alstom will help GE grow its digital advantage

GE recognized the importance of data analytics within the industrials market some years ago, and is ahead of its peers in leveraging the industrial Internet of Things (IoT) (which it calls the "Industrial Internet") to create "smart" machines that can run with greater efficiency. (See our Cisco story on p. 54, for another example of the competitive advantages of harnessing the IoT.) GE's platform allows customers to integrate their own customized efficiency solutions into the platform, which could help drive innovation. Alstom's smart grid solutions will widen GE's lead in the industrial internet race to provide increased efficiency and value for customers through data analytics, such as its "Brilliant Factories" and "Digital Power Plant" services. IoT services are a big revenue driver for GE, which announced in December 2015 that its IoT Predix platform generated USD 5bn in revenues, with an expected USD 6bn in orders in 2015. Additionally, GE sees enormous growth potential in its platform solutions, projecting that the business will triple to 15bn by 2020.

Increased efficiency through the Digital Wind Farm

Strengthening its IoT platform through synergies with Alstrom will also bring emissions reduction benefits by increasing the efficiency of renewables. GE plans to expand its energy portfolio with software for renewable energy integration, such as the "Renewable Desk software platform", and also energy management software. Additionally, through its Digital Wind Farm product, GE can capitalize on IoT opportunities in the area of clean energy. The Digital Wind Farm, introduced in May 2015, is based on a digital twin modelling system, which enables operators to monitor turbines' performance and make adjustments to maximize energy production. GE estimates that the new technology will increase energy production by 20% in wind farms. With a base of almost 30,000 wind turbines worldwide, the company is well positioned to take advantage of digital technology to optimize the efficiency of wind power.

Eco-Design (E.3.1.6)



Source: Sustainalytics

GE's recent boost for its product portfolio should also lead to improvements in its ESG performance, most notably in the area of Eco-Design. As shown in the chart to the left, GE is currently among the 19% of analyzed industrial conglomerates that have made important but non-systematic efforts to integrate eco-design concepts into product design. GE has invested USD 2.3bn in the research and development of products belonging to its "Ecomagination" programme, which is dedicated to developing environmentally sustainable products and services. With the new acquisition of Alstom's power business, GE can also integrate Alstom's research and development processes for renewable energy products and services, which will likely enable the company to more systematically integrate eco-design.

Outlook – Exciting future for GE

The acquisition of Alstom's power and grid business is a groundbreaking move for GE. The investment will boost GE's exposure to the market for renewable energy, which we believe will continue to displace fossil fuel based generation at the margin. While GE Renewable Energy currently accounts for approximately 3% of GE's total operating profit, we expect this proportion to increase over time on the back of strong renewable energy fundamentals. The company's planned acquisition of Metem Corporation will create an additional suite of products that enable customers to achieve emissions reductions. With the Digital Wind Farm, GE is likely to demonstrate the advantages of the "Industrial Internet" for the renewable energy sector, and optimizing its platform for energy management will help to accelerate carbon reduction not only for renewables, but across the industrials sector.

Allianz

Leading the charge on green finance

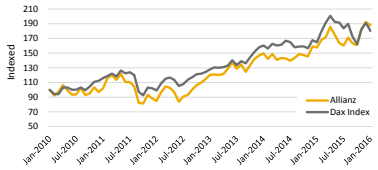
83	4 out of 149	2
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Industry Leader	First decile	Environmental Impact of Products

Domicile: Germany
Industry: Insurance
Ticker: ALV (DB)
ISIN: DE0008404005
Employees: 147,425
MCap (USD m): 62,848*
** as of Dec. 31/2015*

Key insights

- One of the world's top coal financers from 2005–2011, Allianz is in the process of **decarbonizing its assets** and changing its financing strategy.
- Allianz is one of the **world's largest private investors** in the renewable energy sector, with USD 2.7bn committed on a long-term, buy-and-hold basis.
- Allianz's withdrawal of coal sector financing, including USD 245m in equity, is motivated by **financial and brand considerations**.

Stock price performance
Allianz vs. Dax, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
Allianz	83	79	88	84
Prudential	68	58	70	73
Metlife	55	47	62	55
AIG	52	48	63	46
AIA Group	50	38	60	52

Source: Sustainalytics

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Overview

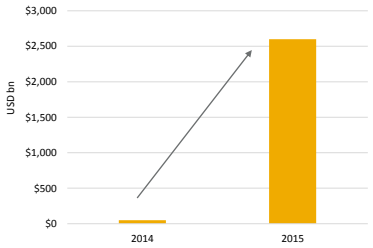
Allianz is Europe's largest insurer, with total assets of EUR 106bn as of 30 September 2015. Extreme climate change events significantly affect property and casualty insurers, who are confronted with increasing losses and claims that hurt their profitability. Hurricane Sandy, for example, cost the insurance industry USD 28bn, while Superstorm Irene led to USD 11bn in insured losses. As Allianz's property and casualty business accounts for 40% of the company's total revenue, Allianz is highly exposed to climate change risk, with additional exposure through its own assets as well as its investment portfolio.

Up until 2011, Allianz was one of the world's largest coal sector financiers. This is set to change as the company implements an ambitious, multi-pronged climate change strategy, announced in November 2015 in the lead-up to the Paris Conference. The most prominent feature of the strategy is a phase-out of debt and equity financing to companies that derive more than 30% of their revenue from coal mining or generate more than 30% of their energy from coal. The fossil fuel divestment "movement" has attracted over 400 institutions with total assets under management of USD 2.6trn although, as discussed above on p. 18, only a fraction of these assets are invested in the world's oil, gas and coal firms.

At the same time, Allianz is planning to boost its exposure to the renewable energy sector. The company is already one of the world's largest private investors in renewables, with more than EUR 2.5bn committed. As a further expression of its shifting financing strategy, Allianz recently joined the Portfolio Decarbonization Coalition, a group of 25 investors committed to "decarbonizing" over USD 600bn in assets. To us, Allianz's climate change strategy signals a clear understanding of the risks and opportunities posed by climate change for insurers.

Changing course on coal

AUM of Fossil Fuel "Divestors"



Source: Sustainalytics

Between 2005 and 2011, Allianz was amongst the world's top financiers of coal mining and coal-fired electricity in India, Colombia and China, with coal assets worth EUR 2.1 bn. In a remarkable change of course, Allianz announced during the lead-up to the Paris climate conference that it would phase out its coal investments in its own account and boost its investment portfolio in clean energy companies. Allianz's coal divestment follows similar moves by industry peers AXA and Storebrand, and the timing of the company's announcement brought widespread media attention. These companies are part of a larger fossil fuel divestment movement that has picked up significant momentum in 2015, reaching USD 2,600bn, up from USD 50bn in 2014, as shown in the chart to the left. The movement includes over 400 institutional investors, including insurance companies, pension funds, university endowment funds and sovereign wealth funds (see p. 18 for a summary of recent high-profile divestments).

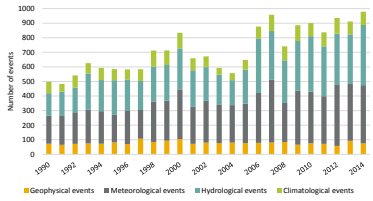
Divesting from coal equities by March 2016

Allianz's divestment is guided by a revenue test: companies that derive more than 30% of revenue from coal mining or generate more than 30% of their energy from coal will no longer be eligible for investment. The company estimates that this commitment will affect approximately EUR 225m in equity (which is scheduled to be withdrawn by March 2016), while bonds worth EUR 3.9bn will be left to expire. Additionally, in December 2015, Allianz joined the Portfolio Decarbonization Coalition (PDC), thus committing to withdraw capital from relatively carbon-intensive companies, projects and technologies. The PDC comprises 25 investors with an estimated total of USD 600bn assets under management.

Varied motivations for divestment

We consider Allianz's divestment from coal, increasing presence in renewables and participation in the PDC to be motivated by three factors: **(1)** an increasing awareness of the potential negative effects of climate change on its business; **(2)** concerns that coal investments may no longer be profitable; and **(3)** the potential for strengthening brand value by intensifying its focus on green finance.

Loss events worldwide by event type



Source: Munich Re

Insurers such as Allianz are exposed to an array of climate change-related risks, either directly through their owned assets or indirectly through their investment portfolios. As we discussed in our sector report Insurance: Shedding light on new industry challenges, one area of exposure relates to the growing number of extreme weather events. According to Munich Re, the total number of worldwide weather-related loss events is increasing, although the numbers from year to year are variable. Munich Re estimates that insurers paid out approximately USD 27bn for natural disaster claims in 2015, 94% of which were weather related. While Allianz's downside exposure to extreme weather events may be outsourced to the reinsurance market, the insurer is still exposed to weather-related losses through business interruption, negative supply chain impacts on the investment side of its business and risks to its own assets.

Second, Allianz is responding to a growing body of evidence suggesting that coal investments may no longer be profitable. Coal is facing a complex set of economic

headwinds, including negative price effects from the US shale gas bonanza, the surge of renewable generation (particularly in Europe) and tightening environmental regulations, which hit coal first because it is the most polluting fossil fuel.

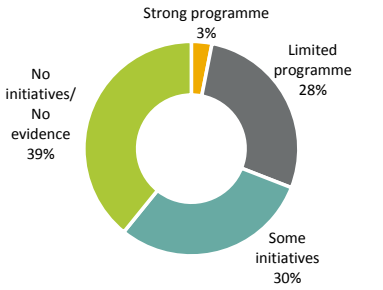
Coal investments dragging on returns

In the same month that Allianz announced its plans to divest from coal, Corporate Knights, a Canadian research company, published analysis on 14 funds totalling USD 1trn, including the Gates foundation, and concluded that carbon-intensive investments had cost the funds USD 22bn in reduced returns. The market's negative reaction to coal companies in the wake of the Paris Agreement, discussed on p. 18, provides another indication that coal is facing strong economic headwinds.

Doubling down on renewables

While Allianz is reducing its exposure to coal, it is ramping up its exposure to renewable energy financing, with the expectation that these investments will offer more stable returns. The company is already one of the world's largest private investors in renewables, with a EUR 2.5bn renewable energy portfolio (up from EUR 2.0bn in 2014). The company's typical investment is long term and in the USD 50m–100m range. Allianz's portfolio includes 55 wind farms and seven solar parks in Europe. Allianz entered the Austrian wind market in July 2015, acquired solar PV plants in Denmark in December 2015 and purchased a wind farm in Finland in January 2016. Allianz aims to double its investments in renewables in the next few years.

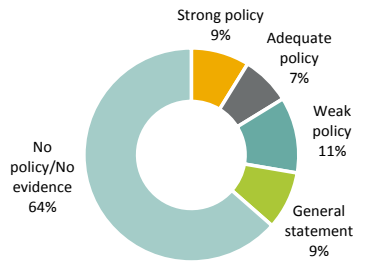
Sustainable Financial Services (E.3.1.15)



Source: Sustainalytics

Finally, Allianz, already considered to have strong brand value in the insurance industry, may consider decarbonization as a way to maintain or even strengthen its reputation through extending its green insurance offerings. Allianz is one of only a few analyzed insurers to have a strong programme for Sustainable Financial Services (see chart at left). For example, in December 2015, Allianz released its first green bond fund, which will invest predominantly in European investment grade bonds as well as in green bonds issued by governments and supranational organizations. As we noted in our insurance sector report, Allianz stands out for its progressive programmes designed to raise awareness within its client base about the costs of climate change, and product opportunities such as green insurance policies. Allianz offers 156 environmental-related products and services for customers, including asset management, assistance and insurance services, which is exceptional in the industry. In 2014, revenues generated by green solutions totalled more than EUR 1.3bn.

Responsible Investment Policy (G.1.3.2)



Source: Sustainalytics

Allianz's participation in the PDC feeds directly into another aspect of its overarching climate change strategy, which is to integrate climate protection into its entire investment portfolio. This approach complements the company's pre-existing "ESG Directive for Investments". Although the insurer previously included ESG questions in its asset manager selection process, Allianz's investments will now be screened against 37 environmental, social and corporate governance criteria, including GHG emissions and energy efficiency. Full transparency across the company's EUR 613bn investment portfolio is expected to be achieved by mid-2016. Compared to its peers, Allianz is one of the few analyzed insurers assessed as having a strong responsible investment policy (see chart at left).

Outlook – Allianz in the pole position

Total commitment of EUR 2.5bn to renewable energy in FY 2015

Allianz's climate change strategy, which features coal divestment, a doubling down on renewable energy investments, and climate protection measures across the company's investment portfolio, signals to us a sophisticated understanding of the risks and opportunities posed by climate change for insurers. As Allianz has been shaping its understanding of sustainability for years, we consider it highly capable at evaluating and capitalizing on green finance opportunities. The company is poised for growth through its expressed commitment to investments in renewable energy and climate-driven insurance solutions. Allianz is well ahead of its peers in terms of developing and offering environmentally friendly investments and is an industry innovator. We believe that decarbonization is likely to add business value for Allianz.

Origin Energy

The rough road to renewables

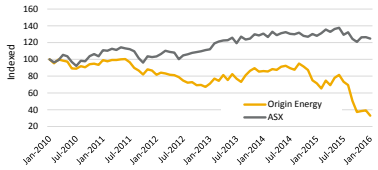
68	34 out of 176	2
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Average Performer	Second decile	Business Ethics

Domicile: Australia
Industry: Oil & Gas Producers
Ticker: ORG (ASX)
ISIN: AU000000ORG5
Employees: 6,000
MCap (USD m): 14,309*
** as of Dec. 31/2015*

Key insights

- Origin was the **first energy company** to sign all seven initiatives of the "We Mean Business" Coalition, signalling its leadership on climate change management.
- Origin's "Solar as a Service" retail offering **has significant growth potential**, as the residential solar market in Australia is booming.
- Origin is looking to **enter the large-scale solar arena in Australia**, though it faces considerable capital challenges.

Stock price performance
Origin Energy vs. ASX, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
Santos	83	78	88	83
AGL Energy	73	60	80	86
Origin Energy	68	62	79	60
APA Group	60	49	64	75
AusNet Services	58	50	55	75

Source: Sustainalytics

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Overview

At first glance, Australia-based Origin Energy might seem an unlikely contender as a company that is "getting ahead of the climate change curve". For starters, the company, which is both a wholesale and retail energy provider, producing energy through seven gas power plants, one black coal plant and a mix of renewable sources, is one of the top ten carbon emitters in Australia, according to the Australian Conservation Foundation. And, similar to its peer Santos, Origin saw its share price take a beating in 2015, losing 60% of its value, due to heavy investments in LNG production and the fallout from the drop in global oil prices.

Nevertheless, Origin is ahead of the curve in exploring opportunities in a lower-carbon economy. In October 2015, Origin signaled its willingness to transition to a more sustainable energy business by joining the "We Mean Business" Coalition and signing all seven of its climate change initiatives (the first energy company to do so). Additionally, Origin has stated that it has no active plans to develop new coal or gas plants, but is considering both wind and solar power projects.

Origin's long-awaited coal seam gas (CSG) to liquefied natural gas (LNG) project near Gladstone shipped its first export on 11 January 2016. Origin hopes that LNG exports will provide much-needed revenue to enable further investments in renewables. Additionally, 2015 marked the introduction of Origin's "Solar as a Service" retail offering, and 2016 may bring new opportunities in Australia's large-scale solar market. We believe that Origin understands clearly that its continued survival depends on a successful transition to a cleaner energy economy. However, Origin faces considerable challenges in its quest to become a more sustainable energy business.

Origin means business

Some renewable assets may be on the chopping block

Australia's renewable energy target requires that 41,000 gigawatt hours (GWh) of electricity be generated from renewable sources by 2020. Electricity retailers such as Origin will be required to pay a penalty of USD 65 per megawatt hour (MWh) if they fail to meet their renewable energy targets (RETs). Increasing its exposure to renewables has been a challenge for Origin. Investing heavily in seven-year planning and construction on its massive USD 17.2bn Australia Pacific liquefied natural gas (LNG) project has put pressure on the company's balance sheet, and the company announced in August 2015 that it would cut 800 jobs by 2017 and sell off a proposed USD 556m in non-core assets. In fact, some of the company's existing renewables assets – which include solar parks and wind farms in Australia, as well as solar, wind, hydropower and geothermal power overseas – may be on the chopping block to help raise funds to maintain the company's investment grade credit rating.

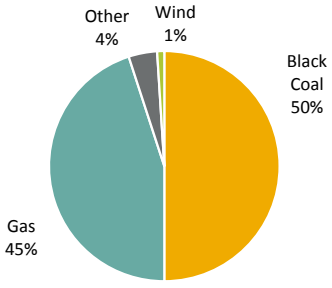
The first energy company to sign all seven climate business initiatives of the "We Mean Business" Coalition

Origin is one of many energy providers dependent on fossil fuels, and most particularly on coal, which are increasingly incentivized to diversify their energy mix. In October 2015, Origin signaled its commitment to this transition by joining the "We Mean Business" Coalition, a coalition of NGOs and businesses urging policymakers to enact meaningful carbon pricing and to support the scale-up of renewables. Additionally, Origin was the world's first energy company to sign all seven of the coalition's climate change initiatives. This action has symbolic importance – a fossil fuel energy company has signalled that the industry must evolve, and has prioritized growing its capabilities and investment in renewable energy.

Origin's commitments include:

- Reporting climate change information in mainstream reports;
- Undertaking responsible corporate engagement in climate policy;
- Adopting a science-based emissions reduction target in line with the International Energy Agency's "450 Scenario";
- Setting measures to factor in a cost of carbon internally to materially affect investment decisions in order to finally reduce GHG emissions;
- Becoming Australia's leading renewable and low-carbon energy provider, procuring 100% of electricity from renewable sources for its office premises and, where possible, for other operations by 2050;
- Reducing short-lived climate pollutants; and
- Removing commodity-driven deforestation from all supply chains.

Origin's Energy Mix in 2015



Source: Origin Sustainability Report, 2015

Origin has also indicated that it will not invest in *new* coal power plants, but the company's commitment may not extend, as some news articles have enthusiastically claimed, to abandoning coal assets and becoming a 100% renewable energy company. Indeed, the breakdown of the company's energy mix at left shows the unlikeliness of such a scenario. However, the company announced at its AGM in October 2015 that it would close its Eraring Power Station "within 20 years", although the plant was already scheduled to be decommissioned in the 2030s, based on its 50-year lifespan. Eraring is responsible for 50% of Origin's generational capacity and 79%

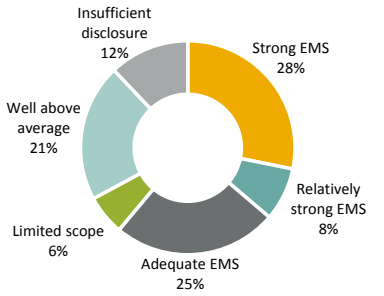
of the company's emissions. Closing the Eraring Power Station could have a profound effect on Origin's emissions footprint, but Origin's carbon intensity will, of course, depend on whether it chooses to invest in renewables, LNG or more coal plants.

LNG – A bridge to renewables?

First LNG export shipped on 11 January, 2016

After more than seven years of planning and construction, Origin's Australia Pacific LNG project, a joint venture with ConocoPhillips and Sinopec, shipped its first export on 11 January, 2016. This is a major milestone for the company, and will initiate cash flow on a project that has stretched the company's funding capabilities to the breaking point. Australia is the fourth-largest LNG exporter globally, and Origin hopes to tap into an export business that generated USD 11bn in revenue in 2013–14. Though LNG prices fell in concert with oil prices in 2015, and may remain low in 2016, research by Australia and New Zealand Banking Group Ltd. predicts that global demand for LNG will rise to USD 34.8bn by 2020, and that Australia will pass Qatar as the world's number one exporter of LNG within the same period.

Environmental Management System (E.1.2)

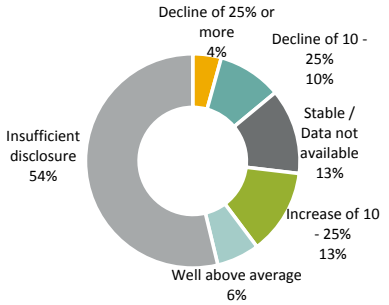


Source: Sustainalytics

From a climate change perspective, the glass is half-full, or half-empty, depending on one's perspective. On the one hand, LNG's relatively lower emissions intensity (approximately half of coal) makes LNG an important transitional step in a global economy trying to wean itself from "dirtier" energy sources. On the other hand, the lower-emissions advantage of LNG may be decreased by fugitive emissions from methane leaks, and Origin is currently under scrutiny for alleged under-reporting of such leaks. Additionally, Origin's coal seam gas activities require the use of hydraulic fracturing (fracking). An intensification of these activities in order to expand LNG exports could raise Origin's exposure to environmental and social issues, such as water use, underground aquifer contamination and tensions with local communities. As shown in the chart to the left, Origin is one of 14 out of 176 analyzed companies (8%) assessed as having a relatively strong environmental management system (EMS), although the company's EMS is less robust than that of top performers in the sector. Origin also has a relatively clean environmental controversy record compared to its peers, but the current incident could indicate a need for stricter quality controls.

Origin's own emissions targets yet to be established

Carbon Intensity Trend (E.1.9)



Source: Sustainalytics

Origin supports Australia's national emissions reduction targets and actively participates in the mechanisms created by the government to achieve the national goal of reducing CO_2 emissions by between 26 and 28% from 2005 levels by 2030. However, Origin has not yet disclosed its own reduction target for its Scope 1 emissions, though it has committed to establishing science-based reduction targets through the "We Mean Business" Coalition. Additionally, the company's carbon intensity has been rising since 2011, and the company is part of the 6% of analyzed peers whose carbon intensity trend is above average for the sector, as shown in the chart to the left. Origin's carbon intensity may further increase if production expands at its LNG plants or at Eraring. Establishing clear emissions reduction targets and guidelines will provide the clarity that investors are seeking to implement carbon strategies within their portfolios.

Solar as a Service and energy storage – A sunnier outlook

Australia has the highest global penetration of residential rooftop solar, with room for further growth

Origin's residential solar services represent a bright spot in its offering, with strong potential for growth. Residential solar, though a relatively recent phenomenon in Australia, is developing at breakneck speed. The country's Clean Energy Regulator reported that the country added 119,000 new rooftop small-scale PV installations in 2015 to create a total of 1.4 million homes with solar installations, giving Australia the highest global penetration of residential rooftop PV, with an estimated one in five homes now powered by solar. In Queensland and Southern Australia, favourable policies have pushed penetration levels still further, to an estimated 40% of residences.

Solar as a Service offering initiated in May 2015

Origin's Solar as a Service offering, initiated in May 2015 in Sydney, Adelaide, Brisbane and the Gold Coast, should favourably position the company to capitalize on the growing potential of the Australian residential rooftop solar market. Modeled on US-based SolarCity's residential solar service, Origin's Solar as a Service removes some of the barriers for residents considering solar power. Solar as a Service requires no upfront investment from residential customers, other than the relatively insignificant cost of cables, etc. to attach the system to their rooftops. Consumers receive the energy at a discounted rate, while Origin owns and maintains the system. Though small operators offer similar programs in Australia, it is the first time that a company of Origin's size and customer base has adopted this service model, which may help Origin attain its goal of becoming Australia's number one residential solar provider.

Partnering with Tesla to add the energy storage component to its residential solar offering

Moreover, in December 2015, Tesla (see p. 23 for more on Tesla's energy storage business) announced that it is partnering with seven Australian electricity retailers to install its 7kWH Powerwall batteries, including Origin. Since one of the limitations to unleashing the full potential of residential solar has been energy storage (residents want power even if the sun is not shining), Origin's partnership with Tesla to bring Powerwall energy storage to Australian homes is a smart move for a company seeking to grow its solar power customer base. Origin plans to offer a comprehensive renewable energy solution to its customers by combining Tesla's Powerwall with Trina Solar panels and Solar Edge inverters, for an expected price of USD 11,900. Though its competitors are planning similar offerings, Origin's customer base of over 4.3 million retail energy customers (including more than 400,000 solar customers) may give it a competitive advantage as the energy storage competition heats up. Origin is also strategically partnering with municipal governments, through partnerships such as the "Randwick Go Solar" campaign, to encourage residents to make the switch to solar power and energy storage.

Large-scale solar in Australia may be next for Origin

Grant funding is critical

The evolving political environment for energy in Australia, as well as the country's overall energy trends, could favour Origin's future development as a solar provider in a country with enormous renewables potential. Grant funding support is crucial for Origin's transition to more sustainable business model. For example, the Clean Energy Finance Corporation (CEFC), which has invested USD 973m in green energy initiatives

in Australia, already provided Origin with a 12-year commitment for USD 70m in funding to support Solar as a Service in July 2015.

Large-scale solar may soon be more cost effective than wind in Australia

Large-scale solar projects are getting a boost of AUD 350m (USD 245m) in grant funding from the CEFC and the Australian Renewable Energy Agency (ARENA) through a programme designed to spur innovation and cost savings in the country's solar sector. Though at present Australian solar has a higher cost per megawatt hour than wind (USD 95 vs. USD 60), the cost of solar is declining, and is projected by ARENA to become more cost effective than wind power post-2020. Origin is one of several energy companies currently seeking a share of the funding for large-scale solar. Origin's proposal, the largest, is to build a 100MW solar plant in Queensland, and the company's experiences with large-scale solar in Chile should lend strength to its proposal. It is an interesting prospect to consider a future Queensland no longer populated by coal or even by LNG plants but by large-scale solar farms, with the transformation beginning to unfold in 2016.

Outlook – Funding is a bottleneck

Will Origin pay penalties for missing its share of the Australia's Large-Scale Renewable Energy Target?

It remains an open question whether Origin's renewables investments will be sufficient to avoid legal penalties for failing to meet its share of Australia's Large-Scale Renewable Energy Target (LRET) by 2020. The target demands the equivalent of 5,000 MW of wind farms, equal to one dozen large wind farm projects. Origin's share of responsibility is, by the company's estimate, roughly one third of the total LRET target, and penalties for Origin for failing to meet its responsibilities on renewables could amount to as much as USD 209m, according to Australia's Business Spectator.

Origin remains vulnerable to the effects of low oil prices, which affect the profitability of its LNG exports. According to the company's 2015 Annual Report, the oil price must reach USD 45 per barrel for Origin to cover its operating costs; as of the writing of this report, the price is approximately USD 30 per barrel. Origin has attempted to limit its vulnerability by purchasing put options on oil for 2017 and forward-selling its LNG at pre-set prices, to avoid suffering the consequences of further reductions in LNG prices. Still, low cash reserves and uncertain revenues make investment in large renewables projects exceedingly difficult.

Origin is embracing cleaner energy opportunities, but will the necessary capital be forthcoming?

Origin's business strategy anticipates and is positioned for a transition to a cleaner energy economy. The company is developing its competencies in renewables and is actively scouting for opportunities to grow its presence in both the residential rooftop and large-scale solar markets in Australia. However, a successful transition for Origin depends on capital. The Australian government has announced a 2030 emissions reduction target of 26–28% compared to a 2005 baseline, and the RET is the government's primary strategy for achieving this reduction. Achieving both the national RET and emissions reduction target will depend on the government lending sufficient levels of financial support to spur investments and innovation in renewables.

Cisco Systems

The Internet of Things: Delivering sustainable value in Kansas City

76 **Overall ESG Score**
Outperformer

23 out of 170 **Relative Position**
Second decile

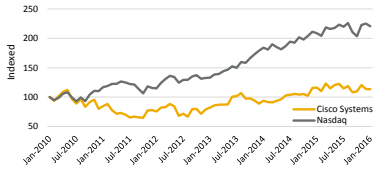
2 **Highest Controversy Level**
Intellectual Property

Domicile: United States
Industry: Tech Hardware
Ticker: CSCO (Nasdaq)
ISIN: US17275R1023
Employees: 74.042
MCap (USD m): 130,608*
** as of Dec. 31/2015*

Key insights

- Cisco is betting big on the Internet of Things (IoT), with an **ambitious platform underway in the US** and additional plans in a growing number of cities globally.
- IoT could potentially **reduce global emissions by as much as 9 gigatonnes (GT)** per year, about the same as total emissions in the US and India in 2010.
- Cisco is well positioned to capture a significant share of the IoT market, which is **forecasted to generate between USD 11–14trn** in value by 2025.

Stock price performance
Cisco vs. Nasdaq, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
EMC	83	88	89	68
Cisco Systems	76	82	79	72
QUALCOMM	75	76	78	69
HP	75	92	67	58
Apple	62	77	45	62

Source: Sustainalytics

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Overview

As Cisco Systems (Cisco) embarks on a new strategy to shed its image as a legacy networking hardware provider, the company is betting that its future lies in the Internet of Things (IoT). As part of this strategy, Cisco has chosen smart city development to demonstrate the practical benefits of its IoT platform. The company's 2016 smart city rollout in Kansas City could serve as a launching pad for a robust business segment. From Cisco's vantage point, IoT, and smart cities in particular, have the potential to revolutionize every aspect of daily life, because by 2050, 70% of the world's population will be living in cities. Smart cities have the potential to positively impact a variety of different industries, including energy, transportation, logistics, food, education, agriculture, manufacturing, housing and healthcare. These sectors offer opportunities to enable the decoupling of economic growth from GHG emissions, and companies, like Cisco, that orient their business models to leverage this trend are poised to deliver sustainable value to investors.

In our view, the unique potential of IoT lies in the convergence of two forces: generating value in a competitive business environment and adapting to a carbon-constrained world. The Paris Agreement and the expected follow-up actions by governments may accelerate the need for companies like Cisco to develop a business strategy that integrates data and analytics to provide actionable operational insights to drive sustainable results. Cisco's strong ESG track record, focus on environmental performance and partnership-oriented IoT strategy signal that the company is competitively positioned to capitalize on the convergence of these two forces to enable a lower-carbon future.

Capturing a trillion dollar market

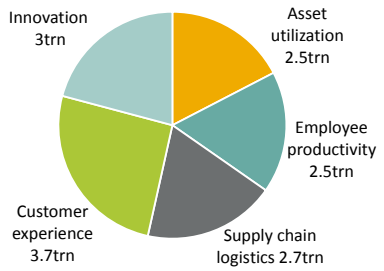
IoT has important sustainability implications

The internet, cloud infrastructure and the declining costs of technology have all contributed to the momentum behind IoT. In essence, IoT refers to a system where objects have embedded sensors connected to the Internet. These sensors enable the collection of detailed data and analytics that can be used to understand various aspects of functionality, performance and, most importantly, ways to integrate sustainability through energy efficiency and waste reduction. Some examples of IoT include smart thermostats that reduce energy use, cars that integrate real-time performance data for fuel efficiency, and water system sensors that enable conservation and spot maintenance issues before the system deteriorates.

Cisco established an IoT division in 2013

Cisco began its focus on the IoT market in 2011 through thought leadership and established an IoT division in 2013. Cisco's early IoT experience has given the company ample time to consider how best to leverage its existing resources to establish a coveted position as an IoT solutions provider. For investors, Cisco offers a unique business opportunity to gain exposure to a nascent market that is expected to generate trillions in value.

How the IoT Delivers 14.4trn in Value



Source: Cisco, Sustainalytics

According to Cisco, the IoT market has the potential to generate USD 14.4trn in value by 2022, through improved business processes and asset utilization (USD 2.5trn), labor productivity (USD 2.5trn), waste reduction in the supply chain (USD 2.7trn), an improved customer experience (USD 3.7trn) and increased innovation and R&D speed (USD 3trn), with applications across the energy, transportation, agriculture and built environment sectors. Regardless of the estimate, the value potential of the market is significant. To capture this value, Cisco has established IoT innovation centres in major cities such as Berlin, London, Toronto and Tokyo. Additionally, the company has taken the lead in developing and deploying smart city infrastructure through its Smart + Connected Communities platform. This platform is Cisco's solution for providing real-time information and services to create sustainable cities, a market segment that Cisco estimates could reach USD 3.3trn by 2022.

Kansas City is an important test case for Cisco to gain experience in providing digital smart cities solutions

For example, in June 2015, Cisco reached a 10-year deal with Kansas City, Missouri to roll out the largest smart city platform in the US, starting in 2016. This project could offer valuable lessons for Cisco and promote the wide-scale application of smart city technologies. Cisco's strategy for Kansas City includes the integration of sensors across a 2.2 mile streetcar line as well as LED street lights in combination with data analytics that can enable energy and traffic management. Additionally, Cisco's smart city platform is intended to have a "Living Lab" feature that allows innovators to test smart city ideas and concepts.

As Cisco deploys its first phase of the smart city platform for Kansas City in the spring of 2016, it can help set the tone for how public-private partnerships can help meet the challenges presented by an increasingly carbon-constrained world. A successful outcome in Kansas City could help the company attract business and new projects in other cities. By gathering relevant and actionable data on operations, cities like Kansas City have the potential to use limited resources responsibly. Through efficient

Helping cities allocate resources

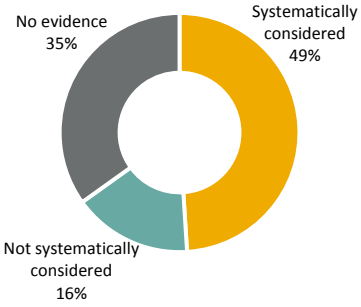
city lighting, for example, Cisco estimates a potential global savings of up to USD 170bn, since lighting accounts for approximately 19% of all electricity consumed in cities globally. As more devices become connected, data from lighting, building security, thermostats, daylight sensors, meters and air quality monitors can enable a city to have a significant impact on how resources are consumed and to develop practical sustainability strategies such as intelligent traffic control and smart parking initiatives. Linking vehicles, traffic and air emissions to air quality can give places like Kansas City the relevant data to manage traffic flows and parking.

Financial, social and environmental dividends

IoT integration could potentially eliminate up to 9GT of GHG emissions each year

We believe that Cisco's focus on smart city innovation offers a strong value proposition. In a competitive business environment, every single percent gain in efficiency and cost reductions can be a game changer. According to the Carbon War Room, an international thinktank working on climate change solutions for business, IoT integration across various sectors could reduce GHG emissions by 9.1 GT annually. This compares, for example, to the total GHG emissions for both the US and India in 2010. Cisco's strong product sustainability and environmental focus should help the company carve out a position as a solutions provider for governments and businesses to meet challenges related to mitigating the impacts of climate change. If Cisco is able to successfully execute its IoT strategy in Kansas City, the company could realize significant financial, social and environmental dividends as a smart city market leader.

Eco-Design (E.3.1.6)



Source: Sustainalytics

In the past, Cisco has faced challenges related to anticipating industry trends and missed out on establishing an early competitive position in software-defined networking. In the context of IoT, however, we believe Cisco has the foundation to competitively capitalize on carbon reduction opportunities due to two factors. One is its strong overall ESG performance. Cisco is considered an industry outperformer in Sustainalytics' coverage universe, and is committed to addressing ESG risks through robust policies and management systems, as well as actively incorporating environmental considerations into its business strategy. Cisco is one of 80 companies out of 170 in the tech hardware industry (49%) that systematically integrate eco-design concepts into product design. The company is also one of 66 out of 180 industry companies (37%) receiving a top score for its GHG reduction programmes. This should give the company a head start when designing digital solutions that improve the sustainability performance of its clients. This is an asset for the application of IoT to energy, infrastructure, emissions and environmental management systems.

Partnerships may create further business opportunities for Cisco

A second factor is the collaborative nature of Cisco's IoT approach. Cisco is pursuing partnerships with both public and private sector stakeholders to develop an IoT platform that integrates sector-specific needs. In addition to working with Sprint in Kansas City, Cisco has agreements with 90 cities, including Amsterdam, Dallas, Berlin, Santiago and Chicago, to deploy its smart city IoT platform by working with local partners. In 2014, it established a USD 250m fund to support new businesses that are focused on IoT. In early 2016, Cisco announced a new partnership with AT&T to further enhance the smart cities framework. These initiatives suggest that Cisco is in

a position to integrate value outside of its own direct R&D activities. Together, these two elements provide Cisco with a competitive advantage to capitalize on upcoming IoT opportunities.

Outlook – Early Mover Advantage

Cisco is well positioned to capitalize on the environmental and financial value offered by IoT

2016 could be a defining year in Cisco's transformation from a legacy hardware provider to a solutions-driven technology company. Its 2016 smart city rollout in Kansas City could serve as a launching pad for a robust Smart+Connected Communities business segment. While Cisco's IoT is clearly ambitious and heavily dependent on a strong execution strategy, we believe the company's innovative efforts could deliver significant financial, social and environmental dividends for its stakeholders. As IoT gains momentum, Cisco may be ideally positioned to capitalize on the business opportunities arising from an intensified focus on carbon reduction.

RWE

A fossil giant makes a giant leap?

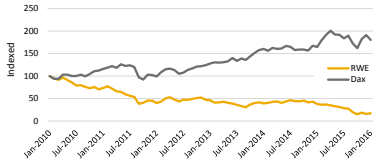
72	43 out of 256	2
Overall ESG Score	**Relative Position**	**Highest Controversy Level**
Average Performer	Second decile	Anti-Competitive Practices

Domicile: Germany
Industry: Utilities
Ticker: RWE (DB)
ISIN: DE0007037129
Employees: 59,784
MCap (USD m): 5.972*
** as of Dec. 31/2015*

Key insights

- RWE is **struggling with the effects of *Energiewende***, Germany's energy transition strategy, and the surge in distributed generation.
- RWE's spinoff of its renewables business may simplify the management of two different asset pools, but it **does not guarantee profits in either segment**.
- The restructuring effectively **bundles RWE's ESG risk** with the parent company, where risk management capabilities are high.

Stock price performance
RWE vs. Dax, 2010–2015



Source: Bloomberg

ESG performance – Peer analysis

	Scores			
Peers	**Overall**	**Env**	**Soc**	**Gov**
EDF	78	79	76	79
RWE	72	67	82	70
E.ON	70	70	73	67
Entergy	68	62	69	79
CEZ	56	51	61	57

Source: Sustainalytics

Overview

"Our conventional power stations are the backup for renewables." So said the CEO of RWE, Peter Terium, when he announced in December 2015 that RWE would spin off its renewable generation assets, grid and retail operations into a separate company. The move, which follows a similar strategy announced by E.ON, a German utility peer, in November 2014, is a competitive response to Germany's *Energiewende* ("energy transition"), which sets ambitious targets in the areas of renewable generation, GHG reduction and energy efficiency. Since the 2000s, attractive subsidies have boosted the supply of "homegrown" or non-utility generated electricity in Germany, particularly from onshore wind and solar PV installations, and have negatively impacted wholesale power prices and utility profits. Remarkably, most of Germany's power generation capacity built since 2000 is not controlled by traditional utilities such as RWE, but by new independent power producers and citizen-driven energy cooperatives. Coupled with Germany's planned phase-out of nuclear power by 2022, a policy decision motivated by the 2011 Fukushima disaster, German utilities have been forced to rethink their business model and value proposition to customers.

A major component of RWE's response to this challenging environment is a reorganization of its assets. RWE's gas, coal and nuclear assets will remain with the parent company, while its renewable assets, grid and retail operations will be housed with the new company, which is expected to have its IPO in late 2016. We take a favourable view of the restructuring from an ESG perspective, as it effectively bundles the highest-risk assets into a single entity and gives the new entity more governance flexibility. While RWE's ESG risk management capabilities are strong, it will be important for the company to transfer its competencies in community relations to the new company, given its focus on high-margin retail operations.

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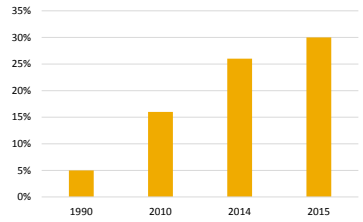
Energiewende – Big ambitions

Energiewende, or "energy transition", was first discussed in Germany in 2010 and implemented through legislation in 2011. The strategy calls for (all goals relative to 1990 base year):

- An 80%–95% reduction in GHG emissions by 2050;
- A 60% share for renewables in the national energy mix (broadly defined as hydro, wind and solar); and
- A 50% increase in energy efficiency by 2050.

The share of renewables in Germany's energy mix



Source: Clean Energy Wire, BMWI

Policy mechanisms put in place to support these goals, including feed-in tariffs, have led to a surge in the production of renewable power. As shown in the chart to the left, the share of renewables in Germany's energy mix has increased from approximately 5% in 1990 to 30% in 2015(e), primarily from onshore wind. For a variety of different reasons, including the mismatch between the historic focus of utilities on large-scale infrastructure developments and the (relatively) small-scale and bottom-up nature of renewable energy projects, Germany's big utilities were largely absent from this boom. Energy cooperatives and private individuals own and supply most of this electricity.

Declining energy demand

In addition to increased competition from "homegrown" electricity, German utilities have been challenged in recent years by anaemic electricity demand. This is a result of Europe's weakening industrial performance, and Germany's improving energy efficiency, which effectively decreases the amount of electricity needed per unit of economic output. The combined result has been significant downward pressure on wholesale electricity prices, which has eroded utilities' profitability.

The effect of the US shale gas bonanza

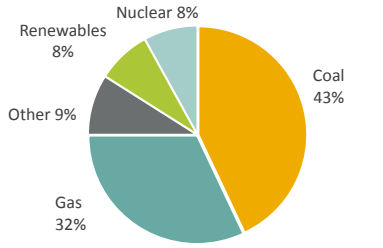
While this situation was already challenging enough for German utilities, two additional outside forces bear mentioning. First is the shale gas bonanza in the US, which has pushed down gas prices in the US and led to an increase in coal exports to Europe. This, in turn, has dampened European coal prices and made gas-fired utilities in Europe more expensive at the margin. By some estimates, over 20 gigawatts (GW) of gas-fired generation was prematurely mothballed in Europe in 2013 as a result. The second was the announcement made by Chancellor Angela Merkel on 30 May 2011 that Germany's 17 nuclear power stations would have to shut down by 2022. This policy, a reversal from the government's previous stance, was in response to the meltdown at the Fukushima nuclear power plant on 11 March 2011.

A perfect storm

The confluence of these factors has been nothing short of devastating for German utilities, including RWE. The growing supply of homegrown electricity, declining energy demand and falling European coal prices, coupled with a forced nuclear shutdown and pressure to boost renewables, have led some to speak of the "death knell" for the sector. In FY 2013, for the first time in its 100 year plus history, RWE recorded a net loss, totalling USD 2b.

Spinoff as a competitive response

RWE Generation Capacity Mix



Source: RWE

It is against this complex backdrop that RWE's spinoff announcement should be viewed. The spinoff amounts to a complete restructuring of its business. Out of the company's 50 generation sites with a total capacity of 49,000 megawatts (MW), renewables, grid and retail operations will be spun off to a new subsidiary, which will be 90%-owned by RWE. The new entity is expected to be publicly floated in late 2016, and will have an estimated 40,000 employees, approximately two thirds of RWE's current total, with an estimated annual revenue of USD 28bn. As CEO Terium said on a conference call with investors, "this is no start-up." As shown in the chart to the left, renewables currently account for 8% of RWE's generating mix. The company's renewables portfolio includes about 3,900 MW of capacity, primarily hydropower and wind. RWE also has a vast 550,000 km-strong distribution network.

A similar but fundamentally different move

RWE's spinoff announcement follows a similar decision taken by E.ON, RWE's local rival. E.ON's plan, first announced in November 2014 and completed in January 2016, is in some ways the opposite of RWE's: E.ON successfully spun off its conventional power business (hydro, gas and coal), and its energy trading and exploration and production unit into a new company called Uniper. E.ON is now focused – as RWE's new entity will be – on renewables and customer solutions. While E.ON had originally intended to spin off its nuclear plants, the company cancelled this part of the deal in September, largely due to political pressure, as Chancellor Angela Merkel has made it clear that utilities will not be able to hide from decommissioning costs associated with the nuclear shutdown through corporate reorganizations.

Good business sense

RWE shares up 17% after the spinoff announcement

In our view, a separation of RWE's conventional and renewable power generation makes good business sense. One reason is operational clarity. It has become increasingly difficult for electric and multi-utilities with a broad asset portfolio to manage and grow in both conventional and new energies. Different types of power generation plants take longer to build and have different infrastructure requirements, including transmission networks, interconnectors and smart systems. Country-specific market rules are still wildly divergent, rendering the EU's ambition to create an Energy Union yet a distant dream. The spinoff addresses this problem, as the new entity will be able to focus entirely on renewable generation, while the parent will focus on growing its coal and gas business, as well as shutting down the company's nuclear reactors. More than half of the funds from the IPO are expected to be invested in renewable energy projects. Targets include the onshore wind market in Ireland and large-scale solar in North Africa.

RWE's approach minimizes transaction costs

RWE's plan to keep its conventional generation assets with the parent company also provides more certainty than E.ON's approach, which is to house these assets in the new entity. Germany's energy transition requires both investment and divestment of core assets. As RWE is predominantly a conventional thermal generator, the required divestment will be relatively small, which minimizes transaction costs.

The market reacted favourably to the deal, with RWE's shares up 17% on 1 December 2015, the day of the announcement. Since 1 December, RWE's shares have risen 15%, compared to a loss of 14% for the DAX index, Germany's large cap benchmark.

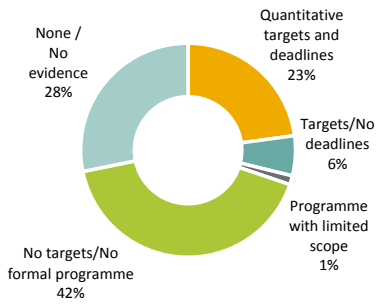
A survival strategy

Of course, spinning off power generation assets can also be seen as a short-term solution to a longer-term problem, which is the increasingly unprofitable nature of conventional power generation in Germany. RWE is repackaging risk, but the overall risk has not changed. For utilities, which are stewards of assets of significant public interest, spinning off particularly risky units flies in the face of the life-cycle management approach to capital assets, and may not be aligned with the spirit of Germany's energy transition. Still, we see RWE's as an effective survival strategy.

ESG implications

We see several advantages in RWE's restructuring from an ESG perspective. The spinoff does not create new ESG risks or opportunities, but it concentrates the bulk of the company's risk exposure in the parent company. In effect, ESG risks will be bundled in neo-RWE, as its focus will be on the high-emitting segments of coal and gas-fired generation.

GHG Reduction Programmes (E.1.7)



Source: Sustainalytics

RWE has both strengths and weakness in its management of GHG emissions. As shown at left, RWE is one of 57 out of 256 analyzed companies in the utilities industry (23%) that have a formal GHG reduction programme with quantitative targets and deadlines; specifically, the company's target is to reduce its emissions by 20% by 2020, compared to a 2005 baseline. Additionally, the company participates in the Carbon Disclosure Project, and its reporting on its GHG emissions is assessed as strong. However, RWE, which was the largest emitter in Europe in 2014, has had a carbon intensity higher than the industry average for the last few years. Our expectation is that the company will continue to produce high levels of GHG emissions, as well as air pollutants and waste, although a continued drop in wholesale prices for conventional thermal power could lead to RWE to produce less electricity in absolute terms and lower its Scope 1 emissions.

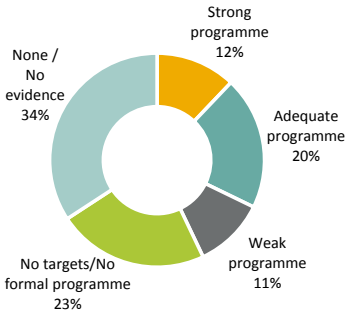
Unlikely to dodge nuclear costs

The restructuring will not impact RWE's exposure to the costs associated with a decommissioning of its nuclear power plants, which have been estimated to be EUR 10bn. While German courts have not clearly delineated who will be held accountable for the management of legacy costs, Chancellor Merkel has made it clear that utilities will not be able to hide from the expense through a simple corporate restructuring.

Renewables pure-plays are in demand

Another advantage is that spinoff creates a renewables pure-play, which are in high demand, given the attractive fundamentals for renewable energy. Investors in Europe already have several options on this front, including Enel Green Power, part of the Enel Group, and EDP Renovaveis, part of EDP Group. As RWE intends to float 10% of the new company's offering, investors will have access to another renewables specialist. This vehicle may particularly appeal to investors under pressure to "decarbonize" their assets, such as those that have signed up to the Portfolio Decarbonization Coalition. Furthermore, unlike the Enel and EDP pure-plays that function as generation-only independent power producers to their parent firms, RWE's new offering also includes the high-margin network and retail business.

Community Involvement Programmes (S.4.2.2)



Source: Sustainalytics

However, it is important to consider the extent to which the outsourcing of RWE's grid and retail operations might negatively affect the parent company's community engagement capabilities. Grid and retail businesses provide a direct conduit to local communities, and much of the organizational intelligence that RWE has built up in this area over the last few years could conceivably be transplanted to the new entity. As we argued in our industry report on the sector ("The Utilities Industry: The Great Transformation Begins"), utilities – for now in Europe, but eventually everywhere – will need to become collaborative service providers and work more closely with their customers in order to thrive in such a profoundly changing environment. RWE is one of 30 companies out of 256 in the industry (12%) assessed as having strong community involvement programmes, which should help the company to mitigate risks in this area.

Outlook – A short-term survival strategy

A spinoff relinquishes life-cycle asset responsibility

Germany's *Energiewende* poses enormous structural challenges for the German utility sector. Due to the long life expectancy of assets in the power generation segment, an incremental shift to a lower-carbon energy mix portfolio is a slow process. Big utility firms like RWE have long-term assets on their balance sheet that cannot be easily abandoned (although the stranding of coal and gas-fired power plants is certainly happening).

RWE's restructuring offers clear business benefits, although it does not address the underlying problem, and the parent company's gas and coal-fired generating units may continue to face headwinds. From an ESG perspective, the restructuring effectively bundles RWE's ESG risk with the parent company, where risk management capabilities are high. However, it will be important for both neo-RWE and the new entity to effectively manage community relationships, as we expect this competency to be increasingly tied to future profits in the sector.

Update on 10 for 2015

Checking in on our selections from last year

Taking a look at our picks from last year

In the *10 for 2015*, published last January, we considered 10 companies whose financial performance we thought could be impacted by ESG factors over the short or long run. As a new feature in our "10 for" series, we review the company storylines from last year to see whether our expectations played out. Below we show the *10 for 2015* companies, our original outlook from January 2015, and a summary of what has transpired over the past 12 months. Our findings show that the financial impact of ESG issues can sometimes be drowned out by other fundamentals factors, particularly over the short run.

Update on 10 for 2015

Company	Original Outlook		Assessment	On track?
DuPont	↘	2015 Summary	We took a moderately negative view of DuPont and argued that revenue capture in the African seed market may proceed more slowly than expected, partly due to the farming practices of smallholder farmers. We also suggested that DuPont's focus on a limited array of hybrid seeds could contribute to biodiversity loss and reputational risks for investors.	
		2016 Update	Revenues from DuPont's Agricultural segment were down 14% for the nine months ending 30 September 2015 compared to same period in 2014, but the major driver was the high US dollar. The company made significant infrastructure investments in Africa in 2015, including a new seed warehouse and office facility in Zambia. Our concerns about reputational risks from DuPont's hybrid seeds did not materialize. At the time of writing, farmers are expressing concern about DuPont's possible merger with Dow Chemical, which would consolidate the market for agricultural chemicals and could lead to higher prices for seeds and pesticides.	
Intel	↗	2015 Summary	We took a positive view of Intel and argued that Intel's plan to build a "conflict-free" supply chain by the end of 2016 offered numerous brand benefits, although we questioned whether Intel's customers would pay more for conflict-free electronics.	
		2016 Update	Intel's efforts to make its entire supply chain conflict free were generally well received in the media. Some reports cast doubt on the legitimacy of "conflict free" designations, but Intel defended its strategy by highlighting that its staff conducted site visits to smelters and engaged with refiners. The company's on-the-ground approach to managing conflict minerals is still considered to be industry leading practice. Criticism of Intel's program certainly brings attention to the complexity of the issue and the difficulties inherent in proclaiming that a product is "conflict free".	
GSK	↗	2015 Summary	We took a positive view of GSK. We acknowledged that groundbreaking changes to the company's sales representative remuneration strategy may drag on short-term profits, but argued the changes will help the company rebuild investor trust in the wake of a record bribery charge in China.	
		2016 Update	GSK received favourable press in 2015 for stopping kickbacks to medical professionals and continues to lead the industry with its alternative remuneration strategy. The company's shares were flat for the year on a total return basis, mainly due to the upcoming expiration of patents.	
LafargeHolcim	↑	2015 Summary	We took a strongly positive view of the merger and argued that it could bring energy efficiency and product development opportunities, as well as improved positioning in the growing market for sustainable building materials.	
		2016 Update	The market did not share our enthusiasm for the merger, with LafargeHolcim's shares down 26% for the year. However, the company took steps to increase its exposure to the sustainable building market, in line with our expectation. In April, Lafarge announced a partnership with Solidia Technologies to commercialize a new low-carbon product for the construction sector. The company is also exploring an affordable low-carbon construction solution for developing countries.	

Update on 10 for 2015 (cont.)

Company	Original Outlook		Assessment	On track?
Lonmin		2015 Summary	We took a strongly negative view of Lonmin and argued that the repercussions from the Marikana Commission could range from reputational and brand effects to short-term pressure on the company's share price.	
		2016 Update	The Commission found that Lonmin did not employ sufficient safeguards to ensure employees' safety. Lonmin is being sued by the families of the victims for USD 69m. Lonmin's shares were down 96% for the year. While the major driver was the collapse of platinum prices (down 26% for the year), the fallout from the Marikana Commission and negative reputational issues for Lonmin may have contributed to the market's weakening view of the company.	
National Commercial Bank		2015 Summary	We took a negative view of NCB. We argued that the company would pique the interest of foreign investors looking for exposure to Saudi Arabia and the market for Shariah-compliant financial products and services, but expressed concern over the company's underdeveloped ESG policies, close ties to the Saudi government and risky project finance activities.	
		2016 Update	Our concerns still stand, although their negative effect on NCB's financial performance did not materialize during the year. The company's 2015 profit was USD 2.4bn, up 5% from 2014 and ahead of analyst expectations. The company also enhanced its positioning in the Shariah-compliant product market by raising USD 266m in an Islamic bond issue in June.	
Telenor		2015 Summary	We took a positive view of Telenor and argued that the company's advanced ESG practices may provide a hedge against country risk in Myanmar, and that the lessons learned could potentially be leveraged in future expansion to emerging markets in Sub-Saharan Africa.	
		2016 Update	Revenue growth from the Myanmar segment was beyond expectations, with revenues increasing from USD 84m in Q1 to USD 158m in Q3. Although the company ran into corruption trouble in Uzbekistan, with Telenor temporarily suspending two executives to enable an investigation, the company's success in Myanmar is in line with our expectation.	
Pemex		2015 Summary	We took a positive view of Pemex. We argued that the slump in oil prices could discourage foreign investment in Mexico's newly liberalized energy sector, but that interaction with the world's oil majors would ultimately lead to improvements in Pemex's health and safety performance and governance.	
		2016 Update	We stand by our view that Pemex will ultimately benefit from a health and safety management perspective from increased interaction with global oil majors, but the company endured a string of safety incidents throughout the year, including a fire on one of its processing platforms in April that resulted in four fatalities.	
Coca-Cola		2015 Summary	We took a negative view of Coke's entry into the premium milk and energy drinks markets. We argued the company was poorly prepared to manage the challenges related to commercial dairy farming and the health concerns of energy drinks.	
		2016 Update	Coke has yet to disclose first-year sales of Fairlife, but the product was slammed by several nutrition experts throughout the year for its emphasis on extra protein. Numerous studies raised further concern about the health risks of energy drinks, but shares in Monster Beverage Corp, owned 17% by Coke, were up nearly 20% in 2015, while the S&P 500 was down over 5%.	
Netflix		2015 Summary	We took a negative view of Netflix based on corporate governance challenges, including a non-responsive board of directors. We argued that investors would be faced with a difficult choice if a takeover offer emerged in 2015, as they had been largely rewarded for sticking with the board's strategy.	
		2016 Update	Our concerns did not translate into a stock performance impact in 2015 – Netflix was up 134% for the year – but we stand by our assessment. Investors again supported lowering Netflix's takeover defences and improving board accountability, with large majorities approving advisory shareholder proposals for proxy access, simple majority voting requirements, and declassification of the board. One director (Richard Barton) failed to receive majority shareholder support, but remains on the board nonetheless. Shareholders have clearly been rewarded for sticking with the board's strategy, but the board's silence in the face of clear investor sentiment may generate shareholder discontent – and may limit shareholder patience – in the future.	

Source: Sustainalytics

Our outlook of Telenor, Lonmin and GSK was directionally correct

In the cases of **GSK**, **Lonmin** and **Telenor**, our outlook for the company was directionally correct, and our expectations were largely borne out. In the case of Lonmin, the company' indictment by the Marikana Commission and associated legal and reputational repercussions may have contributed to investors' weakening view of the company, although the major driver was clearly the collapse in platinum prices (Lonmin's shares were down 96% for the year).

In the cases of **DuPont, Intel, LafargeHolcim, Pemex** and **Coke,** the ESG factors we analyzed contributed to a financial statement or reputational impact that was in line with our expectations, but was drowned out as a result of other factors. In the case of LafargeHolcim, for instance, the company did indeed boost its exposure to the growing market for sustainable building materials, but any gains from this strategy were more than offset by the market's negative take on the merger, the strong Swiss franc and lower concrete prices. LafargeHolcim was down 26% for the year. For Pemex, we had a positive outlook and expected to see best practice transfer from foreign oil majors, but the company suffered a major health and safety incident in April.[51]

In general, isolating the share price impact of single drivers becomes increasingly difficult as the period over which it is measured is lengthened. Nevertheless, we believe that it can be instructive to take share price performance into account in combination with other, more qualitative factors when revisiting our previous year's outlooks.

In the remaining two cases, for **NCB** and **Netflix,** our expectations did not play out. For NCB, we took a negative view, but the company's revenue was ahead of expectations, and our concerns about the financial impact of the company's underdeveloped ESG policies have not yet materialized. In the case of Netflix, we stand by our assessment of the company's governance practices, but the market clearly did not share our concern, with the company's shares up 134% for the year.

Conclusion – A call to action

2016: A shift to systems-level thinking

While last year's report offered a range of different outlooks, both favourable and unfavourable, on a variety of ESG factors, this year's study offers an assessment of 10 companies that are taking unique steps to get ahead of the climate change curve. In next year's edition, we hope to be able to say that the companies selected for the *10 for 2016* have shown progress concerning their management of the climate change-driven risks, products and solutions described herein. We also hope to report that more investors have taken meaningful steps to consider the systems-level implications of their investment choices, and to engage with both companies and governments on their climate change strategies. We are optimistic.

Appendix

Report Parameters

Reference Universe

Global Sustainalytics coverage

Update Financial & ESG Data

January 2016, company data sourced from Capital IQ, financial data from Bloomberg

Publication Date

January 2016

Contributions

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Glossary of Terms

Controversy

Collection of observation points reflecting the controversial behaviour of a company regarding environment, social and governance issues. A controversy is measured by the associated controversy indicator, which is defined at the sub-theme level. Controversies are rated from Category 0 (no controversy) to Category 5 (severe). Each controversy indicator consists of a bundle of event indicators.

Disclosure

Assesses whether a company's ESG reporting meets international best practice standards, including, for example, the ESG reporting standard and its verification, but also tax disclosure, board remuneration disclosure or CDP participation.

Exposure

Defines an area of potential **impact** a company faces due to its business activities. Exposure to key ESG issues is assessed at a **sector** level and is further refined at the company level.

Impact

Refers on the one hand to the effects a company's activities may have on environment and/or society (sustainability impact) and on the other hand to the effects ESG issues may have on a company's bottom line (business impact*)*.

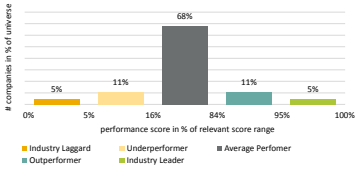
Incident

A single observation point reflecting the controversial behaviour of a company regarding ESG issues. We monitor individual incidents such as, for example, a lawsuit, explosion or strike and assess them based on their impact on stakeholders and the environment (sustainability impact) as well as on the *(reputational)* risk they pose for the company.

Overall ESG Score

Evaluates a company's overall ESG performance on a scale of 0–100, based on generic and sector-specific ESG indicators that are grouped in three (*ESG*) themes and four dimensions (Disclosure, Preparedness, Qualitative Performance and Qualitative Performance), derived by multiplying the raw scores for the relevant indicators with their respective weights.

Relative Position



Classification of companies into five distinct performance groups, based on a company's score (overall ESG score, theme score or dimension score), according to its relative position within the reference universe, assuming a normal distribution of the scores:

- Industry Leader: Within the top 5% of the reference universe;
- Outperformer: Within the top 5% to 16% of the reference universe;
- Average Performer: Within the mid-range 16% to 84% of the reference universe;
- Underperformer: Within the bottom 5% and 16% of the reference universe;
- Industry Laggard: Within the bottom 5% of the reference universe.

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