SUSTAINALYTICS
Thematic Research

Sector Report: Utilities

The Great Transformation Begins

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The Great Transformation Begins

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Key Takeaways

- Few industries are expected to change as radically in the coming years as the Utilities industry. Many companies are **at risk of getting left behind** as they struggle to adapt to a paradigm shift in electricity generation and distribution.
- The traditional large-scale production of electricity is evolving into a decentralised, **customer-centric production system**. Winners will increasingly be defined by an ability to innovate new customer-focused products and services. We consider **(GHG) Emissions, Effluents and Waste**; **Community Relations** and **Product Sustainability** to be the most material ESG issues for the sector.
- Utilities are responsible for **31% of total global greenhouse gas (GHG) emissions** and sit in the crosshairs of a growing number of GHG regulatory schemes. We expect many utilities will struggle under new carbon constraints.
- Community opposition to power plant and infrastructure projects remains strong, yet advanced stakeholder engagement programmes are **lacking across the sector**.
- The global installed capacity of grid-connected solar photovoltaic (PV) systems increased **by 338% from 2009-2012**, which illustrates the **simultaneous threat and opportunity** posed by solar PV for utility incumbents.
- While **alpha seekers** are likely to find new opportunities in the sector, beta-driven investors may be well advised to **strategically underweight the sector**.
- Our model for assessing ESG performance can **help investors identify companies that are well positioned** to navigate the industry's sweeping market and regulatory changes. We rate 234 listed and non-listed securities based in Europe (71), Asia-Pacific (71), North America (64) and rest of the world (28).
- Our top developed market performers are **Terna S.p.A.**, the Rome-based electricity transmission grid operator, and **Acciona SA**, the Spanish renewable energy leader. Our top emerging markets-based performers are **concentrated in Brazil**, and include many of the country's large hydroelectric producers.

Sector leaders

Top ten companies	Country	Score
TERNA - Rete Elettrica Nazionale SpA	Italy	85.4
Acciona SA	Spain	84.1
Hera S.p.A.	Italy	80.6
EDP-Energias de Portugal, S.A.	Portugal	79.2
Enagas SA	Spain	79.2
Sempra Energy	United States	78.9
Snam SpA	Italy	78.6
Verbund AG	Austria	78.6
Hydro-Quebec	Canada	78.3
Suez Environnement Company SA	France	78.0

At the crossroads

The Utilities sector is at a historic crossroads. The traditional business model of providing electricity from large centralised power plants in a highly regulated market environment is under threat. The sector's "Great Transformation" is being driven by changing patterns of regional electricity demand, shifting consumer expectations and unprecedented technological innovation (particularly around distributed generation). In addition to disrupting the sector's conventional model of generating and selling energy, the Great Transformation is bringing many ESG issues to the forefront of utilities management. Climate change, carbon regulation, water scarcity, community relations and strategies to meet the growing demand for sustainable products and services have become boardroom issues for companies in this sector.

Management at most developed market utilities is keenly aware of the challenges facing the sector and recognises the need to alter the industry's conventional business model. Yet there is no consensus among industry leaders about what the modern utility will look like. Much will depend on regulatory reform and incentives. But across the sector, changes are afoot. The Utilities sector, long prized by investors for its predictability, conservatism and stable cash flow, faces a distinctly uncertain future. The Great Transformation will have dramatic implications on the competitiveness of industry players, and investors should understand how their portfolio holdings may be exposed, both positively and negatively, to future industry profit drivers.

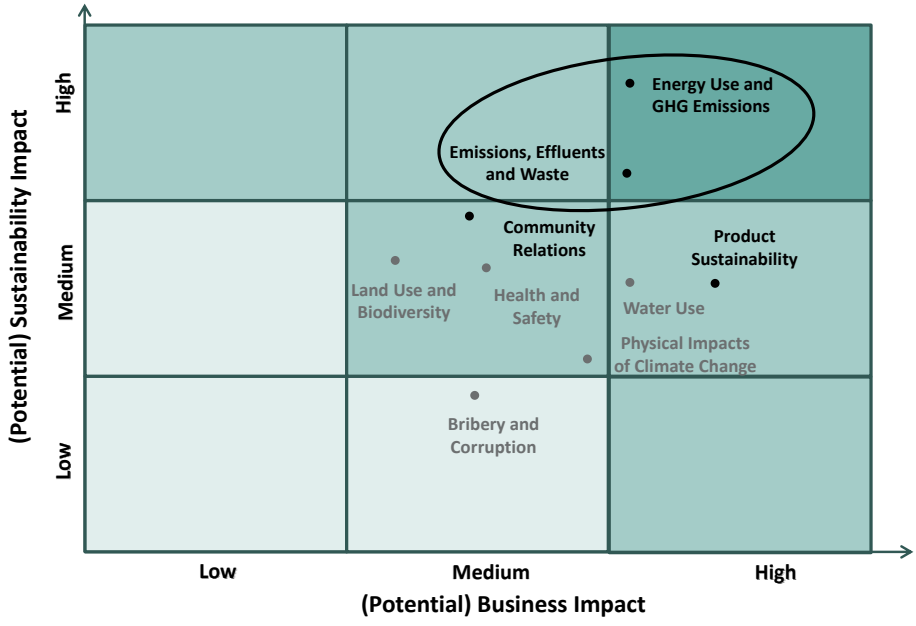
Identifying material ESG issues

The Great Transformation is enhancing the materiality of corporate environmental, social and governance (ESG) performance. Many ESG issues are relevant, but in this report we focus on the ones that we believe are of fundamental importance for investors – our three key ESG issues:

- (GHG) Emissions, Effluents and Waste;
- Community Relations; and
- Product Sustainability.

"Energy Use and GHG Emissions" and "Emissions, Effluents and Waste" have been consolidated into one key issue as indicated in the chart below.

Materiality Matrix – Utilities



Source: Sustainalytics

(GHG) Emissions, Effluents and Waste – Tightening regulations create new risks

Baseline: moderate
Outlook: negative

Legislators around the world have been introducing more stringent environmental regulations aimed at mitigating climate change, improving air quality and minimising ecosystem damage. As major emitters of GHGs and other pollutants, generation and multi-utilities are significantly impacted by such regulations. While GHG regulatory schemes to date have had modest direct financial effects on utility operators, the sector remains highly exposed to future *substantive* regulation. Water and electric utility firms are also highly exposed to the stewardship and responsible discharge of used water, due to the large quantities of water used in their processes. While many utilities are preparing for a carbon-constrained world, robust programmes covering air pollutants, water and waste are surprisingly lacking.

Community Relations – Proactive management is key to success

Baseline: weak
Outlook: neutral

The high-impact nature of the Utilities sector, characterised by investment in capital intensive assets such as power plants, dams and other infrastructure, creates significant potential for community disruption, including negative impacts on air quality, land and water availability. Communities are frequently divided on the net benefits of utility projects, and the "perception gap" between real and imagined losses is sometimes very significant. Failure to manage stakeholder expectations can lead to project delays, increased permitting costs and challenges to a company's reputation. Many industry players are boosting the depth of their stakeholder engagement strategies, but an appreciable number of utilities are behind the curve.

Product Sustainability – The new value proposition

Baseline: moderate
Outlook: positive

Faced with challenges to their traditional business model, forward-looking utilities are looking to generate new revenue opportunities by exploring the delivery of sustainable products and services using intelligent information, smart grid and energy management technologies. Innovation capacity will become an increasingly important driver of utility profits going forward, as new products and services will be required to meet changing customer expectations. Forward-thinking utilities are repositioning themselves to be service oriented.

Key ESG Issues – Leaders & Laggards Overview*

	Developed Markets		Emerging Markets	
	Leaders	**Laggards**	**Leaders**	**Laggards**
(GHG) Emissions, Effluents and Waste	Acciona SA	**Tokyo Electric Power Co. Inc.**	**ELETROPAULO-Metropolitana**	Reliance Power Limited
	Verbund AG	EWE AG	**Companhia Energética de Minas Gerais**	Companhia de Saneamento Basico
	Exelon Corporation	Duke Energy Corporation	AES Tiete S.A.	Open Joint-Stock Company RusHydro
	Snam SpA	GDF Suez SA	**CPFL Energia S.A.**	Beijing Jingneng Clean Energy Corp.
	Suez Environnement Company SA	Ameren Corporation	Empresas Publicas de Medellin E.S.P.	Manila Electric Co.
Community Relations	Centrica plc	**Tokyo Electric Power Co. Inc.**	Enersis S.A.	Gail India Ltd.
	TERNA	***Electric Power Development Co. Ltd.***	Brookfield Renewable Energy Partners	Ratchaburi Electricity Generating
	Sempra Energy	**Vier Gas Transport Gmbh**	Empresa Nacional de Electricidad Chile	Guangdong Electric Power
	Verbund AG	SGSP (Australia) Assets Pty Ltd.	Companhia Paranaense de Energia	**Petronas Gas Bhd**
	American Water Works Company, Inc.	AusNet Services	Empresa de Energia de Bogota	NHPC Ltd.
Product Sustainability	***Electric Power Development Co. Ltd.***	Dynegy Inc.	Eletrobras	JSW Energy Ltd.
	Enel Green Power S.p.A.	Madrilena Red de Gas Finance B.V.	**Companhia Energética de Minas Gerais**	SPP Infrastructure Financing B.V.
	Vattenfall AB	Algonquin Power & Utilities Corp.	**ELETROPAULO-Metropolitana**	Huadian Energy Company Limited
	Hera S.p.A.	**Vier Gas Transport Gmbh**	**CPFL Energia S.A.**	Qatar Electricity & Water Company
	EDP-Energias de Portugal, S.A.	Redexis Gas Finance B.V.	Tractebel Energia S.A.	**Petronas Gas Bhd**

* Names in bold: companies show up multiple times in the same bracket (leaders or laggards); names in bold and italics: companies show up multiple times, but in opposite brackets (i.e. as a leader with regard to one issue, and a laggard with regard to another issue).

Source: Sustainalytics

Selective results of our bottom-up analysis

Industry leaders (DM & EM)

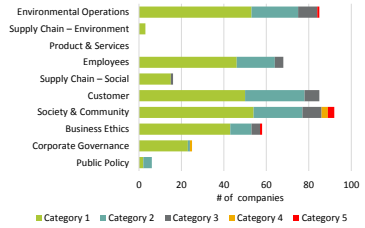
Top five companies (DM)	Country	Score
TERNA - Rete Elettrica Nazionale SpA	Italy	85.4
Acciona SA	Spain	84.1
Hera S.p.A.	Italy	80.6
EDP-Energias de Portugal, S.A.	Portugal	79.2
Enagas SA	Spain	79.2

Top five companies (EM)	Country	Score
ELETROPAULO-Metropolitana	Brazil	77.8
CPFL Energia S.A.	Brazil	75.9
AES Tiete S.A.	Brazil	75.8
Tractebel Energia S.A.	Brazil	74.8
Companhia Energética de Minas Gerais S.A.	Brazil	74.8

Leaders: Within the developed markets, our top sector performers are **Terna**, the Rome-based electricity transmission grid operator, **Acciona**, the Spanish renewable energy leader and **Hera**, the Italian multi-utility. We think these companies are well positioned to navigate the sector's future challenges. Our top emerging markets-based performers are concentrated in **Brazil**, and include many of the country's large hydroelectric producers.

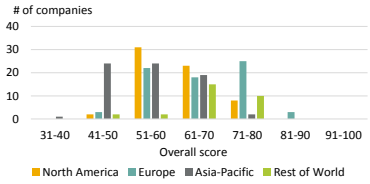
Momentum: The ESG performance for the Utilities sector as a whole **has remained flat in recent years**, with the mean universe score increasing marginally from 59.4 in 2012 to 61.0 in this year's ranking. While exciting developments are taking place in environmental management and product development, the sector's overall performance has been dampened by a number of material controversies.

Qualitative Performance



Controversies: Utilities are primarily exposed to events related to Customers, Environmental Operations and Society & Community. The high-impact nature of utility operations, coupled with the sector's propensity for developing large-scale, capital-intensive projects, means that utilities are highly exposed to risks from operational missteps, including pipeline explosions and toxic releases. Clashes with community groups have become increasingly common in recent years, particularly in emerging markets where regulatory regimes tend to be weaker. As shown in the graph to the left, five Category 5 events have been registered by companies in the Utilities universe in recent years (**Tokyo Electric Power** (2 x), **Korea Electric Power**, **Eletrobras** and **NHPC**).

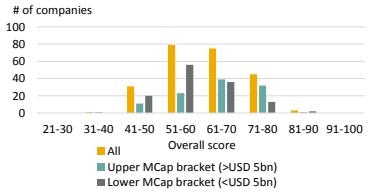
Geographic breakdown



Geographic composition: Our coverage universe for the Utilities sector covers both listed and non-listed securities and consists of 234 companies across Europe (71), Asia-Pacific (71), North America (64) and rest of the world (28). The mean score by region ranged from a low 54.8 for Asia-Pacific to a high of 63.6 for utilities in the rest of the world, largely a result of our generally **favourable view of Brazilian electric utilities**.

Industry: Our coverage universe spans all six GICS sub-industries associated with the Utilities sector, with a concentration in Electric Utilities (92) and Multi-Utilities (41). We are particularly bullish on the **Renewable Electricity sub-industry**, where companies such as **AES Tiete** (Brazil) and **Enel Green Power** (Italy) stand out as top performers.

Size breakdown



Size effect: We find a **moderately positive correlation** (0.3) between company size (as measured by market capitalisation) and ESG performance (as measured by total score), which likely reflects the larger pool of resources that larger market cap (Mcap) companies can utilise when delivering ESG programmes. However, larger companies typically face greater risk exposure to damaging ESG events and controversies.

Industry Trends

The Great Transformation Begins

After successive rounds of privatisation and liberalisation, the Utilities sector is now facing a new groundbreaking challenge – nothing less than a sea change in the way that electricity is produced and distributed. The traditional large-scale, monopolised, unidirectional production of electricity is evolving into a decentralised, customer-centric production system based on diverse energy sources. The Great Transformation is being driven by a variety of forces, including shifting patterns in global energy demand, rapid technological innovation, changing customer expectations and the economics of climate change.

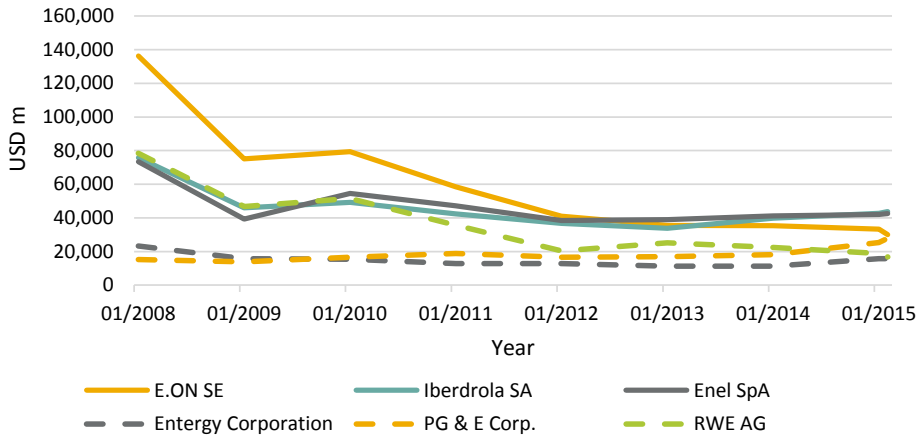
Investing in Utilities – New territory for alpha seekers?

Is the old model working? Utilities in mature markets have struggled in recent years

Utilities should have benefitted from the shift of investor sentiment towards more defensive equities following the shock of the financial crisis in 2008. However, for large U.S. and European utilities, this has not been the case. While this is partly due to their high financial leverage, it is attributed even more to the disappointing development of their net income as a result of anaemic electricity demand in Europe, volatile electricity prices in North America and rising input prices elsewhere in the world (The Economist, 2013).

The market cap (Mcap) of large listed utilities is down 32% on average from 2008

Market capitalisation of selected global utilities, 2008–2015



Source: Capital IQ

The Great Transformation is seen as a solution to climate change risks, resource scarcity and commodity volatility

In parallel, investors' focus has shifted back to the structural issues and challenges facing the sector. The topic dominating the debate about the future of the sector is the Great Transformation of the energy system, which has been put forward as a solution to climate change risks, resource scarcity and commodity volatility. Although these are all issues of global significance, regional differences in attitudes remain, driven also by divergent strategic geopolitical interests.

The Utilities sector has become a much more attractive playing field for alpha seekers

The consequence is different policies and regulatory environments with diverse implications for the corporate sector, as well as dynamic competitive advantages and disadvantages. This diversity is also reflected in assorted performance results, directed by unique regional or country-specific aspects. One conclusion, however, is uniform across the board: the Utilities sector is no longer the predictable sector of old. The potential risks and opportunities have increased, and the sector has become a much more attractive playing field for alpha seekers.

The drivers of change

The transformation of the utility provision system both in terms of production and distribution is driven by three interrelated factors:

- changing patterns of global energy demand;
- new technology and innovation; and
- the economics of climate change.

Below we look selectively at the drivers of change in the Utilities sector and link the discussion to the sector's three key ESG issues.

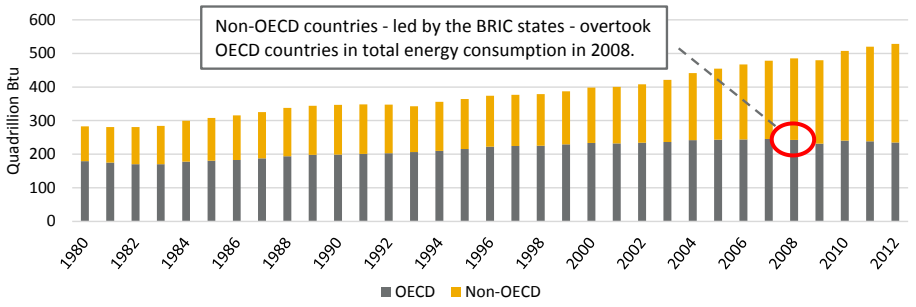
Global energy demand – Shifting regional patterns

Apart from temporary blips observed in the early 1980s, 1993 and most recently 2009, where the financial crisis constricted credit markets and dampened energy demand, the history of global energy consumption is an unequivocal growth story.

Energy demand in developed markets is stagnating

Yet the upward trend in global energy consumption belies a more important reality: energy demand in the developed markets is slowing. While energy demand in non-OECD countries increased by 78% from 2000–2012 (up from 165 to 294 quadrillion British thermal units, or btu), demand in OECD states grew by just 1% (up from 234 to 235 quadrillion btu) over the same period (U.S. Energy Information Administration (EIA), 2015). As a watershed development, non-OECD countries, led by the BRIC countries (Brazil, Russia, India and China), overtook OECD states in total energy consumption for the first time in 2008. They have not looked back since.

Global energy consumption, 1980–2012



Source: US EIA

Some developed markets are generating economic growth with fewer energy inputs

The diverging pattern in energy consumption between OECD (developed markets) and non-OECD (emerging markets) countries is the result of many factors, including disparities in actual and forecasted economic growth (International Monetary Fund,

2014). There is also evidence that OECD economies are getting better at decoupling economic growth from energy use, due to the capture of energy efficiency gains (Kaminska, 2014).

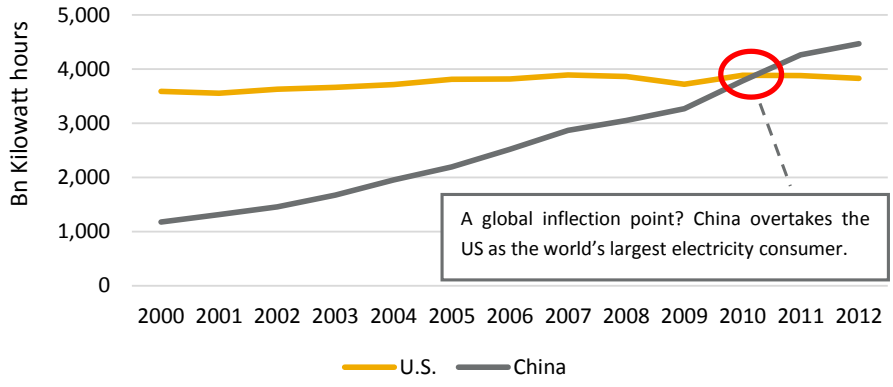
The implications of this trend for utility incumbents in North American and Europe are highly sensitive to a utility's sub-sector classification (e.g. electric utility vs. water utility) and, even more specifically, the type of electricity generation involved (e.g. fossil fuel vs. renewables). But generally speaking, a "plateauing" of energy demand is likely to have negative impacts on utilities' profitability, as operators may have to meet their large (and increasing) fixed costs from a declining revenue base. While in theory this should lead to product innovation, utilities have been generally slow in adapting to this changing structural environment through the introduction of new products and services (although there are signs this is changing). Some utilities are more exposed to the effects of falling energy demand than others, but overall the days of utility shares behaving with near bond-like stability may be coming to a close, at least in the developed world.

China added 13 GW of solar capacity to its grid in 2013, more than the total installed solar capacity in the U.S.

While energy demand is slowing in developed markets, it is surging in emerging markets, which is driving unprecedented investment in new generation capacity. Nowhere is this trend more apparent than in China, where utilities are relying on an increasingly diverse set of energy sources to keep up with demand. While coal remains dominant, accounting for 801 gigawatts (GW) of the country's total installed capacity of 1,247 GW (64%), China is quickly ramping up its renewables portfolio. In 2013, China added a record 12 GW of solar capacity to its grid, the largest single-year expansion of solar PV capacity ever achieved (Bloomberg, 2014). The shifting balance of power in global energy consumption was neatly symbolised in 2011 when China overtook the U.S. as the world's largest consumer of electricity.

Electricity consumption in the U.S. and China, 2000–2012

China overtook the U.S. as the world's largest consumer of electricity in 2011



Source: US EIA

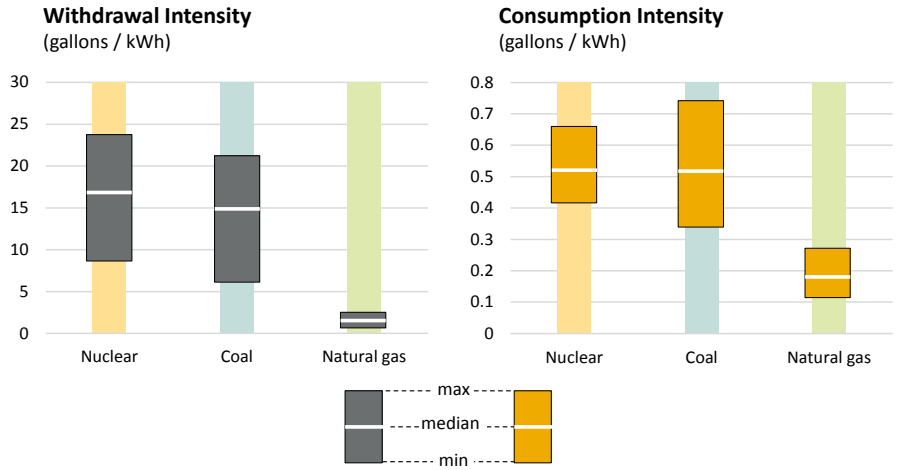
Water demand is closely tied to energy demand

An important corollary to this discussion is that water demand is closely tied to energy demand, as thermal power plants need water to generate steam and cool turbines. As shown in the figure below, withdrawal and consumption intensities vary substantially by fuel source. This is important because many of the markets where electricity

demand is projected to grow most quickly (including China and India) have limited water resources. One estimate puts 85% of China's current generating capacity in water-stressed regions (Bloomberg, 2013). These risks underscore one of the main advantages of renewable generation and help to explain China's continued push into wind and solar (which effectively offer water-free generation).

Water Withdrawal and Consumption by Power Source

Approximately 85% of China's current generating capacity is in water-stressed regions



Source: EW3, 2011

New technology and innovation – The rise of distributed generation

The traditional industry business model is based on a utility (producer) providing electricity to the consumer (customer)

Unprecedented innovation in energy technology is further driving the Utilities sector's Great Transformation. The clearest example of the disruptive effects of innovation can be found in the rise of distributed generation technologies. The traditional industry business model is based on a utility (producer) providing electricity to the consumer (customer). But this model is being challenged by technological advancement in distributed generation technologies, particularly solar photovoltaic (PV) systems.

FIT programmes have been implemented in over 50 countries

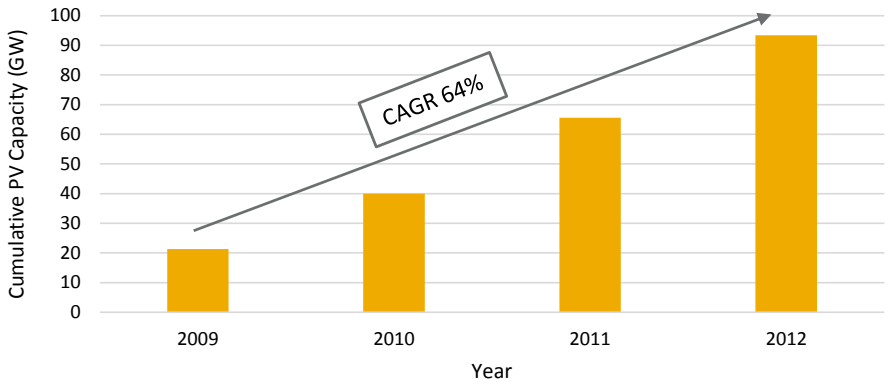
Solar PV's continually lowering cost structure has led to a rapid deployment of decentralised, non-utility electricity production. This transition has been greatly aided by two additional factors: feed-in-tariff programmes and third-party ownership models. Government-backed feed-in-tariff (FIT) programmes have supported solar PV deployment by providing attractive pricing and long-term price certainty for renewable energy developers, including homeowners, businesses, farmers and private investors. FIT programmes, which have been implemented in 68 countries across both developed and emerging markets (REN21, 2014), typically require that qualifying projects be grid connected so that power can be easily fed into the local electricity system. FIT programmes are effectively a policy response to climate change, as countries move to reduce their carbon footprint and improve energy security by subsidising renewable generation.

Third-party ownership models reduce upfront capital requirements for homeowners and businesses

The second factor is the advent of third-party ownership models, which reduces the amount of upfront capital required for businesses and homeowners to install solar PV systems and other renewable technologies (Energy Center of Wisconsin (ECW), 2014).

According to data collected by Renewable Energy Focus, the global installed capacity of non-utility, grid-connected solar PV technologies reached 93.4 GW in 2012, up from 21.3 GW in 2009 (for an increase of 338%, or a compound annual growth rate or CAGR of 64%) (ECW, 2014). In the U.S., an estimated 5% of total energy production now comes from grid-connected solar PV, most of which is on the customer side of the meter (ECW, 2014). In Europe, as in most other developed markets including Australia and Japan, most new solar PV systems coming online are owned by non-utility players.

Annual worldwide growth in solar photovoltaic (PV) installed capacity



Source: ECW, 2014

Distributed generation and the growing market for "homegrown" electricity represent a threat to the conventional utility business model. While rumours of the industry's impending "death knell" are likely exaggerated, the growing supply of non-utility electricity production is clearly compromising utilities' competitive position (Martin, 2014). Solar PV panels currently cost about 1% of their cost from 35 years ago (ECW, 2014), and continued price reductions are expected to further boost the supply of homegrown electricity going forward.

If distributed PV becomes 10% of the U.S. electrical mix, annual utility earnings could be reduced by as much as 41%

Company-specific impacts from this trend will depend on a variety of factors, including location and the extent to which companies depend on electricity generation for revenue. But the potential effects of the distributed generation phenomenon are clearly material. A recent study from the U.S. Department of Energy's Lawrence Berkeley Lab found that if distributed solar PV becomes 10% of the U.S. electrical mix, annual utility earnings could be reduced by as much as 41% (Satchwell et al., 2014).

E.ON announced in December 2014 that it would spin off its nuclear and coal plants to focus on renewable energy

How are utilities responding? Some are moving to suppress the solar PV industry by lobbying regulators for more favourable pricing conditions (Bradford and Hoskins, 2013). Others are boosting their exposure to renewables. **Duke Energy**, for example, has built 1,700 milliwatts (MW) of renewable capacity since 2007 (Martin, 2013). And Germany's largest utility, **E.ON**, grabbed headlines in December 2014 when it

announced that it was spinning off its nuclear and coal plants to focus its core business on renewable energy (Geiger and Drozdiak, 2014).

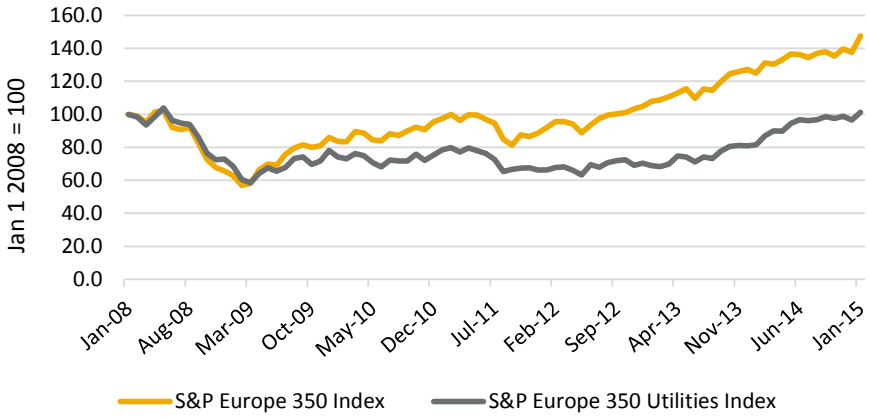
The growing interest among established utilities in renewables is encouraging (and understandable), but it does not change the fundamental question: will utilities be able to generate and deliver electricity (even electricity derived from renewable sources) more cheaply than their own customers can? With this question in mind, forward-looking utilities are actively diversifying their product and service menu to include energy management and other non-traditional functions although, as mentioned above, many industry players have been slow to innovate on this front.

The market is taking a dim view on the future earnings of publicly traded utilities

It remains to be seen how quickly utilities will be able to adapt to the scope of the challenge before them, but the market is certainly taking a dim view on the future earnings potential of publicly traded utilities, at least in Europe. The S&P Europe 350 Utilities index is up only 1% from January 2008, compared to 47% for the market as a whole.

The S&P Europe 350 Utilities index is up 1% from January 2008, compared to 47% for the European market as a whole

Share price performance of European utilities, 2008–2015



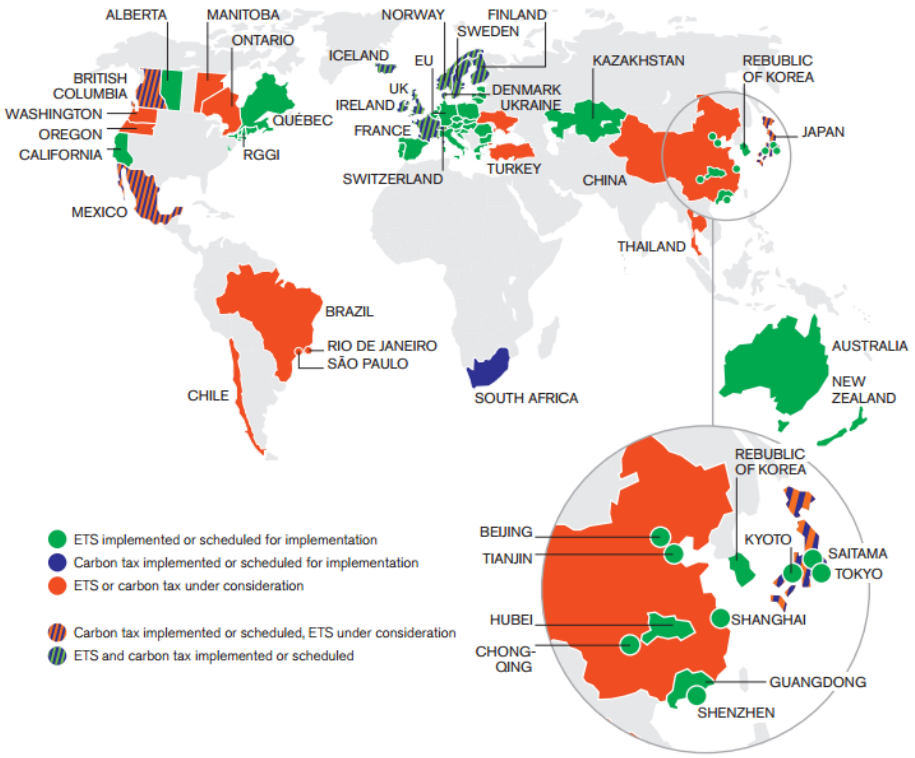
Source: Bloomberg

Economics of climate change – Commodifying GHGs

Closely related to shifting patterns in regional energy demand and technological innovation is the economics of climate change. In the same way that distributed generation and technological innovation in the sector is trending upward, carbon regulation is on a long-term upward trajectory.

Mechanisms to put a price on carbon have been implemented in approximately 40 countries and 20 sub-national jurisdictions (World Bank, 2014). Examples include: the European Union Emissions Trading Scheme (EU ETS); India's Perform, Achieve and Trade (PAT) scheme; Alberta's Specific Gas Emitters Regulation (SGER); and the U.S. Regional Greenhouse Gas Initiative. A further 18 countries, including China, are in the process of developing regulations (International Emissions Trading Association, 2013).

Map of existing, emerging and potential emissions trading schemes



Source: World Bank (2014)

Mechanisms to put a price on carbon have been implemented in 40 countries and 20 sub-national jurisdictions

The Utilities sector is, and will be, targeted in virtually all of these schemes because of the substantial environmental impact of fossil-fuel-based generation. The Utilities sector is responsible for more GHG emissions than any other sector. In 2011, the Utilities sector was responsible for approximately 31% of total GHG emissions (CAIT2.0, 2014).

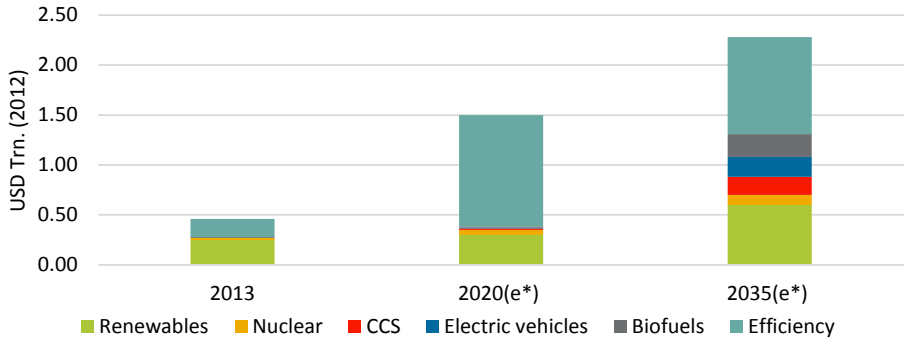
The pathway to carbon regulation has taken many twists and turns over the years, and the direct financial impact of carbon pricing schemes to date on utility players is unclear (LSE, 2014). Our view is that the sector is highly exposed to future *substantive* regulation, which looks increasingly likely. The landmark climate accord announced between China and the U.S. in November 2014 may be a harbinger of regulatory momentum, although some experts argue the deal can be met by enforcing existing policies (The Globe and Mail, 2014).

The landmark climate accord announced between China and the U.S. in November 2014 may be a harbinger of regulatory momentum

In any case, the impact of concerted policy action on utility incumbents will depend on a host of factors, including where utilities operate, their fuel mix and carbon efficiency and their bargaining power. But, generally speaking, it is likely to (further) improve the competitiveness of low-carbon generation. According to the International Energy Agency's 450 Scenario, USD 4.2trn will need to be invested from 2013 to 2035 in low-carbon technologies and energy efficiency technologies in order to limit global temperature increase to 2°C (International Energy Agency (IEA), 2014).

Global investment in low-carbon technologies and energy efficiency in the 450 Scenario

Over USD 4trn will need to be invested in low-carbon technologies between 2013 and 2035



* Estimate

Source: IEA, 2014

The U.S. Clean Power Plan may require U.S. power plants to cut carbon dioxide emissions by 30% by 2030 from 2005 levels

In the U.S., where the coal industry is already struggling, there are indications that meaningful regulation may be coming down the pipeline. The recently announced U.S. Environmental Protection Agency's (EPA) Clean Power Plan aims to cut carbon emissions from U.S. power plants by 30% by 2030 from 2005 levels (EPA, 2014). While the final timeline is still under debate, the rule is likely to make coal-fired generating units less competitive relative to natural gas-fired plants, renewables and nuclear energy, as coal contains approximately twice as much carbon as gas on a per-energy potential basis (EIA, 2014a). The EPA estimates that the plan could impose up to USD 9bn in new costs on U.S. utilities (EPA, 2014a), although some analysts have suggested that coal-dependent utilities will be able to pass some of these costs onto consumers through rate increases.

Changing perception of nuclear?

The Fukushima disaster of 2011 significantly altered the global risk perception of nuclear power. While some countries, including Germany, have halted their nuclear plans, other countries, such as India and China, are expanding their nuclear capacity. Yet across the board, safety protocols have been tightened, and public disapproval of nuclear power has increased.

Virtually all developed market utilities now use a carbon price in scenario planning

The economics of climate change and the growing "commodification" of greenhouse gases are forcing utilities to confront their carbon exposure head on. Virtually all developed market utilities now include a future carbon tax or cap and trade scheme in their portfolio analysis, with prices ranging from USD 6 to 60 per tonne (Carbon Disclosure Project, 2013). While most carbon regimes offer considerable "wiggle room" for companies, through the use of gratis permits and other measures, fully implemented carbon prices at even the lower end of this scale could have dramatic financial consequences. Of course, for European utilities, it could be argued that the EU ETS is not currently providing a strong signal for low-carbon investment, as prices for emission allowances have dropped by approximately 70% since the beginning of Phase II in January 2008. But the status quo should not necessarily be taken as evidence

that carbon pricing in the EU (and elsewhere) will not become more substantive nor generate more material financial impacts in the future.

Outlook: Entering a new paradigm

While alpha seekers are likely to find new opportunities in the sector, beta-driven investors may be well advised to strategically underweight the sector

The Great Transformation is forcing a strategic re-think across the Utilities sector. We are skeptical that the industry as a whole is adequately prepared to deal with the magnitude of change implied by the Great Transformation and the related sustainability challenges. While alpha seekers are likely to find new opportunities in the sector, beta-driven investors may be well advised to underweight the sector over the short to mid-term as utilities adapt to the hollowing out of their longstanding business model. Industry players are taking significantly different approaches in ESG management, and risk differentials remain high. It will be increasingly important for investors to know how their utility holdings are positioned around the sector's material ESG issues.

Bottom-Up Analysis

Interpreting the numbers

Our coverage universe for the Utilities sector includes 234 listed and non-listed equities across both developed and emerging markets

On the following pages, we provide an overview of company performance within the "Utilities" sector, according to the Global Industry Classification Standard (GICS). The Utilities sector includes six GICS sub-industries: Electric Utilities; Gas Utilities; Multi-Utilities; Water Utilities; Independent Power Producers and Energy Traders; and Renewable Electricity (S&P, 2014). Our coverage universe includes 234 listed and non-listed equities across both developed markets (DM) and emerging markets (EM).

Structure of our evaluation: three ESG themes and four management dimensions

Our evaluation is based on the classic three-pillar structure used in responsible investment analysis, which consists of three main themes: Environment, Social and Governance. The number of indicators used to assess each theme, as well as indicator weights, is industry specific. Indicators and indicator weights are determined based on their financial materiality and overall relevance for industry stakeholders. Indicators can also be grouped into four management dimensions: Disclosure; Preparedness (policies, programmes, etc.); Quantitative Performance (employee turnover rates, environmental emissions figures, etc.); and Qualitative Performance (controversies). For the Utilities sector, we use a total of 68 indicators.

Utilities – Sector-specific weight matrix*

		Dimension			
Theme	**Weight / # Indicators**	**Disclosure**	**Preparedness**	**Quantitative Performance**	**Qualitative Performance**
Environment	45.0%	4.8%	31.7%	28.7%	34.9%
	24	3	11	7	3
Social	30.0%	0.0%	38.3%	15.0%	46.7%
	23	0	12	7	4
Governance	25.0%	18.0%	43.0%	0.0%	39.0%
	21	5	13	0	3

* Representing the weight of themes within the overall rating and for the dimensions associated with the themes

Source: Sustainalytics

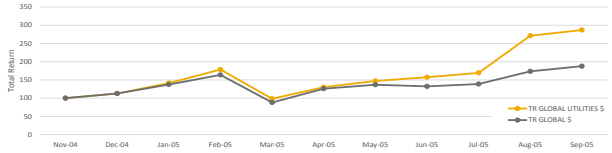
How ESG scores are computed and aggregated

The raw scores we allocate at the indicator level range from 0–100 points. They are then multiplied by their appropriate weights, summed up and recalibrated to arrive at scores for each ESG theme and an overall ESG score. Based on their scores, companies are allocated to five distinct performance groups: Industry Leader; Outperformer; Average Performer; Underperformer; and Industry Laggard. This grouping is based on companies' relative position within the industry and assumes a normal distribution of scores. For a more detailed description of our methodology, please see the Appendix.

Developed Markets (DM)

Universe analysed:	**DM Utilities**
Number of constituents:	**110**
Updated:	**16 February 2015**
Source company data:	**Capital IQ**

Stock market performance



Source: Thomson Reuters Datastream

Sector leaders

85 **Overall ESG score**
TERNA – Rete Elettrica Nazionale Societa per Azioni

89 **Environment score**
Acciona SA

90 **Social score**
United Utilities Group PLC

91 **Governance score**
Hera S.p.A.

TERNA is the sector leader for DM Utilities with a score of 85. Terna's top overall standing reflects the company's advanced ESG practices and reduced risk exposure. **Acciona,** the Spanish renewable energy player, had the highest Environment score (89), driven by the company's concentration in renewables. **United Utilities Group** is the top Social performer, on the basis of its strong Health & Safety programmes. **Hera Spa**, the Italian multi-utility, was the top Governance performer. Key features of its governance strategy include comprehensive disclosure standards and a clear separation of responsibilities and duties.

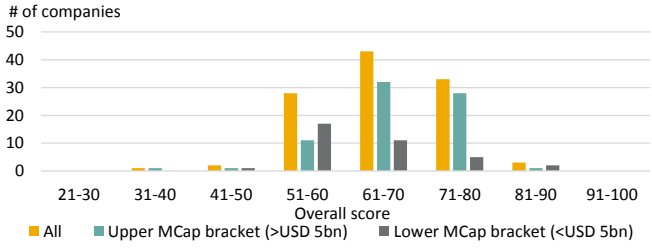
Overall ESG score and company size

Top five companies upper MCap bracket (>USD 5bn)	Country	MCap (USD m)	Score
TERNA - Rete Elettrica Nazionale Societa per Azioni	Italy	10,090	85.4
EDP-Energias de Portugal, S.A.	Portugal	14,136	79.2
Enagas SA	Spain	6,622	79.2
Sempra Energy	United States	22,399	78.9
Snam SpA	Italy	18,960	78.6

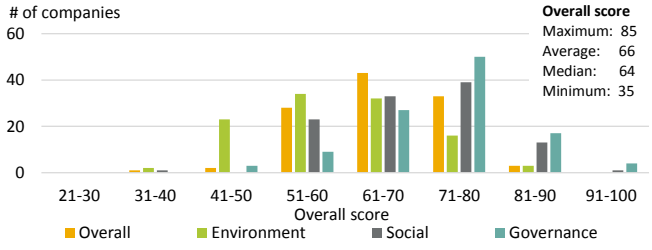
Top five companies lower MCap bracket (<USD 5bn)	Country	MCap (USD m)	Score
Acciona SA	Spain	3,777	84.1
Hera S.p.A.	Italy	3,406	80.6
A2A SpA	Italy	3,520	72.6
EVN AG	Austria	2,672	71.3
Acea SpA	Italy	1,161	69.2

Distribution of scores

Distribution by MCap bracket



Distribution by ESG theme

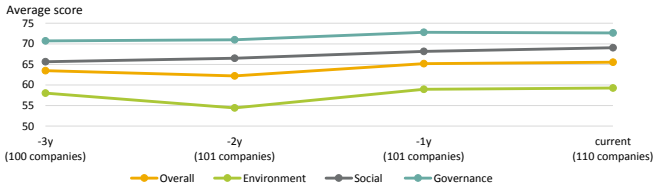


Overall ESG scores within the DM Utilities universe ranged from a high of 85 for **TERNA**, the Rome-based electricity transmission grid operator, to a low of 35 for **Tokyo Electric Power Co Inc. (TEPCO).** With a mean universe score of 66 and standard deviation of 8, TEPCO is an outlier, the only security to fall outside +/-3 standard deviations from the mean. This reflects our ongoing concerns about the company's response to the Fukushima nuclear disaster.

We find a moderately positive correlation between company size (MCap) and company ESG performance, with a coefficient of 0.26. This likely reflects the greater pool of resources that large Mcap companies can access when developing ESG programmes.

The main strength area for DM Utilities is Governance, where the universe had an average score of 73, compared to 69 for Social and 59 for Environmental. This reflects the growing emphasis placed on strong business ethics and corporate governance practices across the DM Utilities universe.

Momentum ESG scores



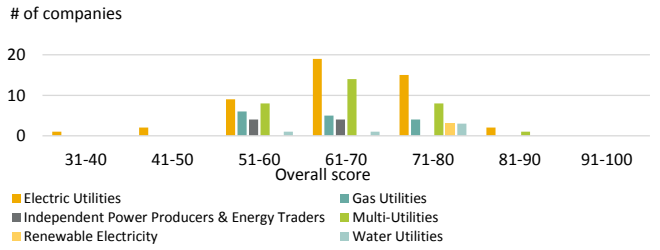
Momentum Leaders (highest yoy performance)	Score	-1y	change
The AES Corporation	64	51	13
Enel Green Power S.p.A.	75	66	9
Vattenfall AB	78	69	9
Anglian Water Services Ltd.	76	68	9
Suez Environnement Company SA	78	71	7

Momentum Laggards (lowest yoy performance)	Score	-1y	change
Power Assets Holdings Limited	64	72	-8
TransAlta Corp.	63	71	-7
Drax Group plc.	63	68	-6
American Electric Power Co., Inc.	62	67	-5
Endesa SA	71	75	-4

Overall ESG performance among DM Utilities has remained relatively flat in recent years, with the mean universe score increasing from 64 in 2012 to 66 in 2015, for a gain of 3%. The bulk of this improvement has come from improved Social scores, which are the result of growing awareness across the sector about the importance of sophisticated community management programmes and the trend toward more customer-focused business models.

The AES Corporation stands out as the momentum leader, with its overall score climbing from 51 in 2014 to 64 in 2015. **Power Assets Holdings** had the biggest year-on-year decline, with its overall score dropping from 72 in 2014 to 64 in 2015.

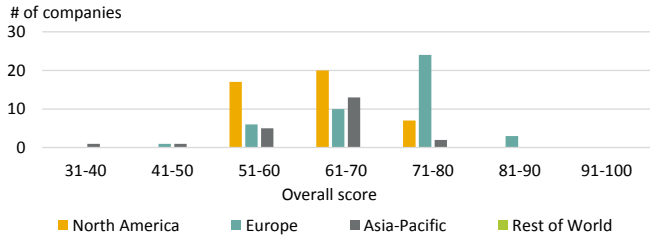
Rating distribution by sub-industry and region



Leading company in each sub-industry		MCap (USD m)	Score
Electric Utilities	TERNA - Rete Elettrica Nazionale Societa per Azioni	10,090	85.4
Gas Utilities	Enagas SA	6,622	79.2
Independent Power	Electric Power Development Co. Ltd.	4,456	67.2
Multi-Utilities	Hera S.p.A.	3,406	80.6
Renewable Electricity	Enel Green Power S.p.A.	13,440	75.2
Water Utilities	Anglian Water Services Ltd.	n.a.	76.4

Overall scores in the DM Utilities universe vary substantially by sub-industry, which reflects differing norms with respect to ESG disclosure, programmes and performance, as well as unique risk exposures. While it includes only three companies, the renewable electricity sub-industry had the highest mean score (73 vs a universe mean of 66), which is consistent with our generally bullish view on renewable energy developers. The Independent Power Producers sub-industry had a mean score of only 60, which was largely a function of poor disclosure practices relative to sector-wide norms.

The leaders table reflects the significant "performance gap" that we find across sub-industries. For example, while **TERNA** needs a score of 85 to lead the electric utilities sub-industry**, Electric Power Development** achieves the same status with a score of 67 within the Independent Power Producers sub-industry.



Leading company in each region		MCap (USD m)	Score
North America	Sempra Energy	22,399	78.9
Europe	TERNA - Rete Elettrica Nazionale Societa per Azioni	10,090	85.4
Asia-Pacific	Osaka Gas Co., Ltd.	8,121	75.1
Rest of World	n.a.	n.a.	n.a.

ESG performance varies as widely by geography as it does by sub-industry, which again illustrates the overriding influence of local norms on company behaviour. With an average score of 70, European utilities fared best in our model, followed by utilities based in North America (63) and Asia-Pacific (61). The performance gap was particularly striking across Environment indicators, which supports our view that, within DM markets, utilities based in Hong Kong and Australia face the highest exposure to environmental risk.

The top overall performers by region included: **Sempra Energy** (North America); **TERNA** (Europe); and **Osaka Gas** (Asia-Pacific).

Disclosure, Preparedness, Performance – Sector leaders

97 **Disclosure**

EDP–Energias de Portugal, S.A. and Endesa SA

79 **Preparedness**

Enel SpA

91 **Quantitative Performance**

Acciona SA

In addition to measuring companies' ESG performance, Sustainalytics' indicators can be grouped into four management dimensions: Disclosure; Preparedness; Quantitative Performance; and Qualitative Performance. **EDP** and **Endesa** are leaders in Disclosure, providing stakeholders with comprehensive disclosure on a wide range of Social and Environmental indicators. Italy's **Enel** is the top-performer on Preparedness, with exceptional policies and management systems across its diverse business activities. **Acciona**, the Spanish utility, had the highest Quantitative Performance, a result of best-in-class performance on specific quantitative indicators, including Energy Mix and Carbon Intensity.

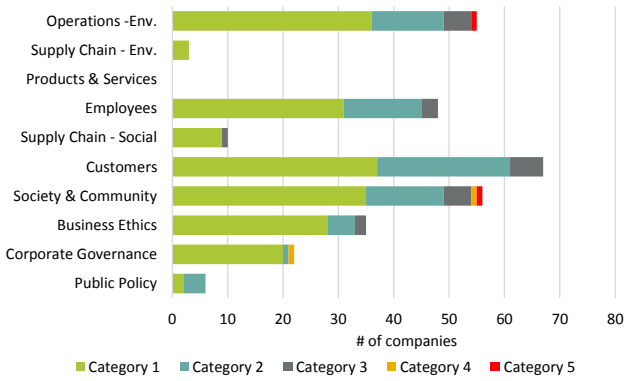
Qualitative Performance – Most controversial companies

5 **Category 5 – severe**

Tokyo Electric Power Co. Inc.

Qualitative Performance is a measure of a company's exposure to controversies. Under Sustainalytics' framework, Category 5 events represent the most egregious cases of mismanagement, posing severe downside risks to companies and their investors. **TEPCO** is the only company in the DM Utilities universe currently facing exposure to a Category 5 event. In fact, the company is exposed to two Category 5 events, both of which stem from the 2011 Fukushima incident. While TEPCO's stock price is up 47% from October 2014 (as of 1 February 2015), we remain concerned about the company's future corporate integrity, with downside problems related to community mistrust, allegations of fact falsification and rising costs related to compensation and Fukushima decommissioning.

Qualitative Performance – Distribution of Event type



DM Utilities are primarily exposed to events related to Customers, Environmental Operations and Society & Community. The high-impact nature of utility operations, coupled with the sector's propensity for developing large-scale, capital-intensive projects, means that utilities are highly exposed to risks from operational missteps, including pipeline explosions and toxic releases. Clashes with community groups have become increasingly common in recent years, particularly in emerging markets where regulatory regimes tend to be weaker. As shown in the table to the left, two Category 5 events have been registered by companies in the DM Utilities universe in recent years (both tied to TEPCO).

Company Portrait: GDF Suez S.A

Outlook
Positive

64 **Overall ESG Score**
Average Performer
(55th out of 110)

3 **Highest Controversy Level**
Emissions, Effluents and Waste;
Anti-Competitive Practices

Domicile: France
Sector: Utilities
Sub-Industry: Multi-utilities
Ticker: ENXTPA:GSZ
ISIN: FR0010208488
Sedol: B0C2CQ3
Employees (FY 2013): 147,200
MCap: USD 54,681m

Analyst View

GDF Suez is a diversified multi-utility in a true sense from both a business-line and geographic spread. To manage such divergent business environments, the company has strong ESG policies in place for a number of key ESG issues, and thus a high level of preparedness. It has developed a full set of sustainable development "roadmaps", in a process of integration throughout the company. GDF Suez's demonstration of its awareness of environmental and social risks is outstanding. On the performance side, the less-impressive overall ESG score of 64 is attributable to a number of relatively significant controversies and stagnant Quantitative Performance, signifying difficulties putting great policies into practice.

Company characteristics	Score			Rank
(current & momentum)	-3y	-1y	curr.	curr.
Overall	62	62	64	55
Environment	56	58	53	74
Social	62	63	78	23
Governance	75	69	67	85
Disclosure	55	59	58	55
Preparedness	48	51	62	27
Quantitative Perf.	34	43	44	31
Qualitative Perf.	93	82	76	109

Company Description

Paris-based GDF Suez engages in a full range of electricity and energy management services, as well as the production, storage and distribution of natural gas. Besides France, it has significant presence in the Benelux, U.K., the Americas, the Middle East, Australia, Thailand and China. Approximately half of GDF Suez's EUR 13.4bn EBITDA (FY2013) originates from energy businesses, while the rest was divided between natural gas, infrastructures and energy services. As a baseline power provider, its electricity division has a diversified portfolio, with natural gas forming the majority. Fully 60% of the group's revenue was from contracted or regulated segments, while 40% was from merchant activities. Since 2013, reporting of former group entity Suez Environnement S.A. has been separated.

ESG Performance

The recent improvement in GDF Suez's Social score (up from 63 in 2014 to 78 in 2015) has been driven by the introduction of strong human rights policies and detailed community engagement programmes. As one of the most internationalised companies in the sector, GDF Suez is exposed to numerous controversies. The most prominent are massive collateral air pollution in Australia, public health and air pollution litigation in Italy and illegal market partitioning with E.ON. Of note, the company has a case that successfully mitigated ESG risks surrounding the formerly controversial Jirau Dam in Brazil.

The company ultimately aims to develop an integrated business model by rolling out low-carbon technologies, engaging energy efficiency service providers and maintaining gas provision supply. GDF Suez's high level of ESG awareness is evidenced by its broad 2015–20 objectives on GHGs, renewable energy installations, occupational safety, biodiversity and employee shareholding.

Analyst

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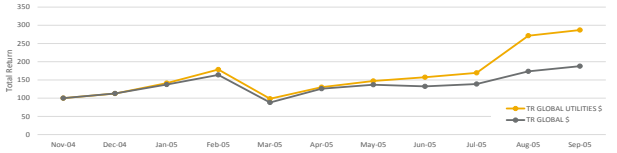
Emerging Markets (EM)

Universe analysed: **EM Utilities**
Number of constituents: **80**
Updated: **16 February 2015**
Source company data: **Capital IQ**

Stock market performance



Source: Thomson Reuters Datastream

Sector leaders

78 **Overall ESG score**
Eletropaulo

76 **Environment score**
Eletropaulo

87 **Social score**
Enersis S.A.

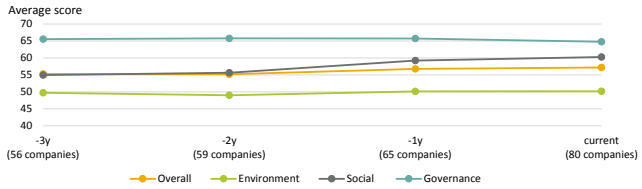
94 **Governance score**
Companhia Paranaense de Energia

Top five companies EM countries	Country	MCap (USD m)	Score
ELETROPAULO-Metropolitana	Brazil	603	77.8
CPFL Energia S.A.	Brazil	7,068	75.9
AES Tiete S.A.	Brazil	2,638	75.8
Tractebel Energia S.A.	Brazil	9,603	74.8
Companhia Energética de Minas Gerais S.A.	Brazil	7,201	74.8

The sector leader for EM Utilities is **Eletropaulo**, which was formed during the deregulation of the Brazilian energy sector in the 1990s. AES Eletropaulo performed well in our model due to its superior environmental programming (the company also has the top Environmental score) and overall ESG strategy. **Enersis S.A.**, the Chilean utility, had the highest Social score (87), driven by well-executed Health & Safety programmes and performance. Based in Medellin, Colombia, **Companhia Paranaense de Energia** was the top Governance performer with a score of 94. The company has separated the function of Board Chairman and CEO, and over 85% of the company's directors are independent.

As shown in the table to the left, Brazilian utilities took the top five positions in the EM Utilities universe, reflecting our generally favourable view of the country's electric generation sector.

Momentum ESG scores

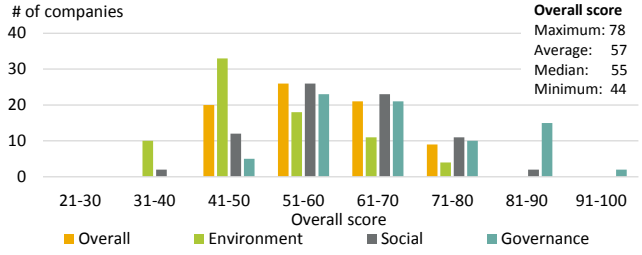


Momentum Leaders (highest yoy performance)	Score	-1y	change
Gail India Ltd.	61	47	13.2
EDP - Energias do Brasil S.A.	73	61	12.3
Electricity Generating Public Co. Ltd.	60	51	9.5
Tata Power Co. Ltd.	66	56	9.4
Companhia De Saneamento De Minas Gerais.	67	59	7.9

Like their counterparts in the DM Utilities universe, companies in the EM Utilities universe have enjoyed a modest improvement in overall ESG performance in recent years, with the mean universe score up from 55 in 2012 to 57 in 2015. Compared to the DM Utilities mean score of 66, we find EM Utilities to be more poorly positioned as a group on material ESG themes, although there is considerable variability from top to bottom in both universes. Companies with particularly strong performance track records include **Gail India**, whose score climbed from 47 in 2014 to 61 in 2015.

Distribution of scores

ESG Breakdown



Scores for EM Utilities are more broadly dispersed for EM Utilities than for EM Utilities. Neglecting ESG factors, hence, would be a particularly risky stance for investors. Like DM Utilities, EM Utilities' strength is in Governance, where the universe had a mean score of 65, compared to 60 for Social and 50 for Environment. The generally poor environmental performance of EM Utilities is a red flag for investors, although wide discrepancies are found within the EM Utilities universe.

Company Portrait: Gail India Ltd.

Outlook
Neutral

61

Overall ESG Score
Average Performer (24th out of 80)

4

Highest Controversy Level
Community Relations

Domicile: India
Industry: Utilities
Sub-Industry: Gas Utilities
Ticker: BSE:532155
ISIN: INE129A01019
Sedol: 6133405
Employees (FY 2013): 4,020
MCap: USD 7,200m

Analyst View

Gail India Ltd. (GAIL) has improved its sustainability performance in recent years. The company's overall ESG score of 61 is up from 47 in 2014, due in large part to improvements in the company's disclosure practices and programme development. For instance, GAIL recently enacted programmes covering GHG reduction and water management, with 2020 as a target year. While environmental performance is an emerging strength area for GAIL, workplace safety and industrial relations are historic weak spots. In 2014, leakages from one of the company's gas pipelines caused a series of fatal explosions, killing 21 villagers in southern India. This incident reveals the gap that exists between the company's ESG preparedness in terms of policies and procedures and on-the-ground performance.

Company characteristics (current & momentum)	Score -3y	Score -1y	Score curr.	Rank curr.
Overall	47	47	61	24
Environment	45	45	66	7
Social	40	43	45	77
Governance	57	57	70	28
Disclosure	0	0	100	1
Preparedness	24	24	43	16
Quantitative Perf.	0	0	6	78
Qualitative Perf.	87	89	90	72

Company Description

Headquartered in Delhi, GAIL is a state-owned enterprise based in natural gas processing and distribution. With 2013 revenues of USD 10bn, it is the largest gas company in India, with a pipeline network of approximately 11,000 kilometres. GAIL is also engaged in the manufacture of basic chemicals, fertilisers, synthetic materials, extraction of crude petroleum and gas, as well as electricity generation. GAIL is a participant in the Shwe Gas consortium in western Myanmar, owning an 8.5% stake in offshore gas fields, and a 4% stake in an onshore gas pipeline that transports to China and India.

ESG Performance

GAIL's remarkable improvement in ESG performance stems from the recent development of basic ESG policies and programmes on key environmental issues. The company sets 2020 as a target year to achieve a 33% reduction in GHG intensity levels compared to a 2010-11 baseline, and a 45% reduction in water consumption intensity. GAIL does not disclose an environmental policy, but its operational units are all managed under International Standardisation Organisation (ISO) 14001 environmental management systems. It has an ambitious plan to construct 500 MW wind power facilities in India by 2018.

GAIL has been involved in a number of serious community-related incidents. In 2014, a gas pipeline explosion in southern India took the lives of 21 villagers and inflicted significant property damage. While the company had safety protocols at its substations, there was no management system to monitor the integrity of its assets. A government investigation found Gail negligent in having invested in corroded pipelines. Abroad, Gail owns an 8.5% stake of the Shwe Gas consortium in offshore Myanmar, together with a Chinese partner CNPC. Gail's involvement in the construction of onshore pipelines through regions ripe with civil unrest makes the company complicit in the problems associated with human rights abuses in Myanmar.

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Key ESG Issues

High exposure, significant performance gaps

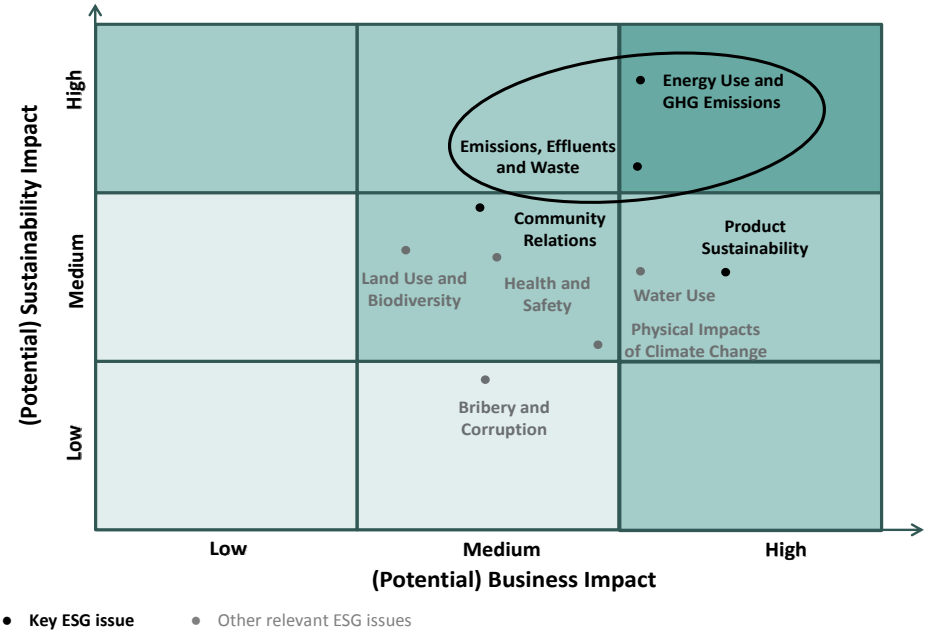
As suppliers and managers of life's essentials, the Utilities sector sits at the heart of the modern economy. The stable supply of electricity, water and gas enables economic growth and expansion across all other industries. While the Utilities sector faces exposure to a variety of ESG themes, we believe four issues are of primary significance for investors going forward: Energy Use and GHG Emissions; Emissions, Effluents and Waste; Community Relations; and Product Sustainability. We have identified these issues based on our assessment of the depth, breadth and duration of potential impacts. We have merged the first two issues into a "super issue", which leaves us with a total of three key ESG issues.

Introducing key ESG issues for Utilities

The materiality matrix below includes all ESG issues we consider relevant for the Utilities sector and highlights those we have identified to be ***key*** from a two-dimensional impact perspective. **Sustainability impact** is defined as the impact ***of*** a company on its stakeholders, while **business impact** is the ESG issue's impact ***on*** a company. An ESG issue is considered a key ESG issue within Sustainalytics' framework if the magnitude of its potential impacts (Exposures) is highly material with regard to at least one of the two dimensions, as measured in terms of depth, breadth and duration of impact. The magnitude of potential impact is measured with the so-called Exposure score, which falls into one of three categories (low, medium, high).

Nine ESG issues have been identified for the Utilities sector

Materiality Matrix – Utilities



Source: Sustainalytics

At the sub-industry or individual company level, Exposure scores can differ from the ones shown in the matrix above, driven by specific factors such as product involvement, business models, location, or company size.

As highlighted in the matrix, we have come to the conclusion that four issues are of primary significance for investors: **(1)** Energy Use and GHG Emissions; **(2)** Emissions, Effluents and Waste; **(3)** Community Relations; and **(4)** Product Sustainability. In the analysis that follows, we consolidate the first two into one "super issue", which we have labelled (GHG) Emissions, Effluents, and Waste. Hence, in the following we refer to just three key ESG issues.

Sustainability and Business Impact

All three key ESG issues demonstrate a high significance across a number of sustainability impact areas

The tables below graphically illustrate how the ESG issues for the Utilities sector impact different sustainability and business impact areas. All three key ESG issues demonstrate a high significance across a number of sustainability impact areas. (GHG) Emissions, Effluents and Waste, for example, is assessed to have a potentially high impact in seven out of 14 sustainability impact areas. Community Relations has potentially high impacts in five impact areas, while Product Sustainability has potentially high impacts in four areas.

Utilities sector – Areas of potential Sustainability Impact

	Areas of Sustainability Impact													
Key ESG Issue	GHG Levels	Air Quality	Land	Water Quality	Water Availability	Biodiversity	Animal Welfare	Local Communities	Customers	Empl. Health & Safety	Labour Rights & Conditions	Contractors & Supply Chain	Human Rights	Society
(GHG) Emissions, Effluents and Waste	●	●	●	●	○	●		●	○	◐			○	●
Community Relations		●	●	○	●	○		●			○	○	●	○
Product Sustainability	●	○	○	○	●	○		○	●					●
Land Use and Biodiversity		◐	●	○	○	●	◐	○		◐				○
Health and Safety								○		●	●	●	○	○
Water Use				●	●		◐	○						○
Physical Impacts of Climate Change			●	●	●	○		●	○			◐		○
Bribery and Corruption								◐	○		●	●		◐

low impact medium impact high impac

Source: Sustainalytics

Business impact: (GHG) Emissions, Effluents and Waste is again associated with the largest number of high impact areas

Moving on to business impacts (see table on the next page), (GHG) Emissions, Effluents and Waste is again associated with the largest number of high impact areas (five out of eight), followed by Community Relations, Product Sustainability, and Health and Safety (each with three areas of high impact).

Focusing on the business impact areas individually, i.e. moving down each column in the table, Operational Risks stands out from a materiality perspective, as it is regarded as a high impact area for five of our eight ESG issues. This is followed by Litigation Risk (effecting high impacts for four out of eight ESG issues), and Regulatory Environment, Reputation Risks and Asset Risks, each of which is associated with high impacts for three out of eight issues.

It is important to note here that the different areas of impact are not distinct, but overlap or are interrelated in many cases. For instance, emissions-intensive activities

may be subject to tighter regulatory requirements and may cause negative reactions from civil society, in the form of grievance and compensation claims (litigation and reputation risks), operational disturbances due to sabotage (operational risks) and questions about the long-term viability of assets.

Operational Risks stands out from a materiality perspective, as it is regarded as a high impact area for five of our eight ESG issues

Utilities sector - Areas of potential Business Impact

	Areas of Business Impact							
Key ESG Issue	Regulatory Environment	Litigation Risks	Reputation Risks	Client Demand	Asset Risks	Operational Risks	Employee Motivation	Hiring Capability
(GHG) Emissions, Effluents and Waste	●	●	●	●	●	●		
Community Relations	●	●	●		●	●	●	●
Product Sustainability	●		●	●	●	●	●	
Land Use and Biodiversity		●	●		●		●	
Health and Safety	●	●				●	●	●
Water Use			●		●	●		
Physical Impacts of Climate Change		●		●	●	●		
Bribery and Corruption		●	●	●			●	●

● low impact ● medium impact ● high impac

Source: Sustainalytics

Each of the three key ESG issues we have identified will be discussed in detail in the following sections. In each section, we first analyse the sector's exposure and assess the factors that leverage or deleverage exposure at the sub-sector and/or individual company level. Secondly, we evaluate ESG performance and management quality by examining relevant indicators across four dimensions: Disclosure; Preparedness; Quantitative Performance; and Qualitative Performance. Each section concludes with a discussion of the leading and lagging companies and an outlook.

(GHG) Emissions, Effluents and Waste – Tightening regulations create new risks

The Utilities sector is highly exposed to a wide variety of ESG issues, but perhaps nowhere is this exposure more immediately material than in the case of (GHG) Emissions, Effluents and Waste. The sector's exposure to these issues primarily stems from the large environmental impacts associated with electricity production and the increasingly stringent regulatory environment in which utilities are operating. The U.S. EPA's Clean Power Plan, which seeks to impose limits on carbon emissions from U.S. power plants, is a recent example of how regulations can have material implications for companies in this sector.

Sustainability Impact

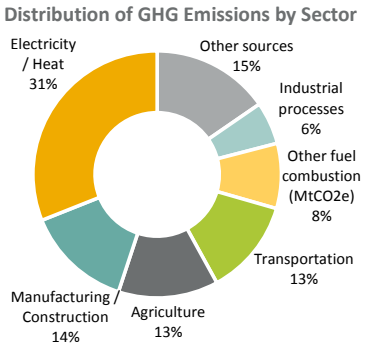
We begin the discussion by taking a look at the sector's exposures, i.e. the areas of potential impact with regard to this particular issue. As a starting point, we once again refer to the "Areas of Impact" table on page 24, of which we provide an extract below. It shows that we have identified seven areas of high sustainability impact. These include: GHG Levels; Air Quality; Land; Water Quality; Biodiversity; Local Communities; and Society.

Areas of Sustainability Impact

	Areas of Sustainability Impact													
Key ESG Issue	GHG Levels	Air Quality	Land	Water Quality	Water Availability	Biodiversity	Animal Welfare	Local Communities	Customers	Empl. Health & Safety	Labour Rights & Conditions	Contractors & Supply Chain	Human Rights	Society
(GHG) Emissions, Effluents and Waste	●	●	●	●	○	●		●	○	○			○	●

○ low impact ○ medium impact ● high impac

Source: Sustainalytics



Source: CAIT

GHG Levels

GHGs are typically generated by the practice of combusting fossil fuels in the electricity generation process. Global greenhouse gas emissions from electricity and heat production stood at 14,379 million tonnes of CO_2e (carbon dioxide equivalent) in 2011, compared to 6,434 million tonnes of CO_2e from manufacturing and construction and 5,815 million tonnes of CO_2e from transportation (CAIT2.0, 2014). Emissions from electricity and heat production represented 31% of total global greenhouse gas emissions in 2011. As shown in the pie chart to the left, the Utilities sector is the largest GHG emitter of any sector.

Other Emissions

In addition to greenhouse gases, utilities are heavy emitters of other pollutants, including nitrogen oxides (NOx), sulphur oxides (SOx), particulate matter, carbon monoxide, dioxin, mercury and hydrogen chloride. While these airborne pollutants tend to be strictly controlled by regulators, even permittable releases can sometimes have harmful effects on air quality, the health of local communities and ecosystems.

Coal-fired generation units have been particularly targeted by regulators and NGOs in recent years due to coal's carbon-rich composition

Coal-fired power plants contribute to 18,200 premature deaths in Europe each year

A 2013 report by the Brussels-based Health and Environment Alliance found that emissions from coal power plants in Europe have contributed to 18,200 premature deaths, 8,500 new cases of chronic bronchitis and over four million lost working days across the EU each year (HEAL, 2013). In the U.S., the U.S. EPA's 2014 mercury standard – which primarily targets coal-fired electric utilities – is expected to prevent 11,000 premature deaths, 4,700 heart attacks and 130,000 asthma attacks across the U.S. each year (EPA, 2014b).

Biodiversity, Water Quality and Availability

The U.S. electric power industry requires an estimated 136 billion gallons of water per day to operate

The management of Emissions, Effluents and Waste also has implications for water availability, water quality and biodiversity. Water is used in thermoelectric power plants to generate steam as well as cool steam that has passed through the plant's turbines. The U.S. electric power industry alone requires an estimated 136 billion gallons of water per day to operate, ranking slightly behind agricultural irrigation as the most significant source of freshwater withdrawals in the U.S. (Feeley et al., 2006).

Effluent often contains pollutants that can damage water resources and fish habits and contribute to biodiversity loss

Beyond the issue of water availability, a key sustainability concern is wastewater discharged by utilities into surface water systems (known as effluent). While effluent is regulated in most jurisdictions, it often contains pollutants that can damage water resources and fish habits and contribute to biodiversity loss. Pollutants include untreated sewage water, heavy metals, salts and other contaminants. Besides pollutants, changes in fish habits and biodiversity loss can be attributable to the presence of utility plants or dams altering the course and temperature of water flow, both upstream and downstream.

Business Impact

Altogether, we have identified five areas of severe business impact with respect to this key ESG issue, as shown in the table below (which is an extract of the table on page 25). These include: Regulatory Environment; Litigation Risks; Reputation Risk; Asset Risks; and Operational Risks.

Areas of Business Impact

	Areas of Business Impact							
Key ESG Issue	Regulatory Environment	Litigation Risks	Reputation Risks	Client Demand	Asset Risks	Operational Risks	Employee Motivation	Hiring Capability
(GHG) Emissions, Effluents and Waste	●	●	●	●	●	●		

● low impact ● medium impact ● high impac

Source: Sustainalytics

Regulatory Environment

The U.S. EPA's Clean Power Plan may require U.S. power plants to cut emissions by 30% below 2005 levels

One of the clearest business impacts associated with Emissions, Effluents and Waste is the prospect of carbon regulation. Unlike many of the externalities produced by the Utilities sector, such as SOx and NOx, which have been regulated in developed market countries since the 1970s, GHGs are still unregulated or underregulated in many jurisdictions. However, the recent trendline towards carbon regulation, coupled with the enormity of the Utilities sector's carbon footprint, will almost certainly have dramatic business impacts and financial consequences for utilities and utility investors going forward. As one example, the U.S. Environmental Protection Agency's (EPA) recently announced Clean Power Plan may require U.S. power plants to cut carbon dioxide emissions by 30% by 2030 from 2005 levels (EPA, 2014a).

Litigation and Reputational Risks

Non-compliance with regulations can lead to substantial reputational and litigation risks

In addition to regulatory concerns, companies in the Utilities sector are exposed to considerable litigation and reputational risks. Non-compliance with rules on Emissions, Effluents and Waste can negatively affect local community residents, and litigation may be lodged to represent allegedly affected "non-humans" such as national parks or endangered species. Court disputes can take a long time, especially when the direct causal relations between the conduct of utility companies and the observed damage are ambiguous. Reputational risks run higher in such circumstances, even before judicial decisions are made.

Asset Risks

European gas-fired power plants were stranded in 2013

The threat of power-producing assets becoming "stranded" is also a risk for companies in the Utilities sector. Stranded assets are assets that have been prematurely shut down or devalued due to unforeseen shifts in market conditions driven by changes in national energy policies and regulations or fuel price developments. For instance, the sustained drop in coal prices observed in Europe throughout 2012 made coal-fired plants much more competitive – and gas-fired plants much less competitive – at the margin. Coupled with reduced overall demand for electricity as a result of Europe's nascent recovery from the financial crisis and weak EU ETS prices, European utilities announced in 2013 the premature closure of over 22 GW of gas-fired generating capacity (Caldecott and McDaniels, 2014).

Impact of national energy policies – Germany's exit from nuclear energy as an example

In Germany, the loss of competitiveness of gas-fired plants is also driven by the government's decison to exit from nuclear energy. The political turnaround has resulted in the fact that investments in nuclear plants have become "stranded". It also caused an unwanted side effect, since nuclear capacities are not replaced by modern and CO_2 efficient gas-fired plants in the first place, but by "dirty" coal-fired plants due to the economics of the German energy market model. In particular, gas-fired plants are not well suited in combination with the increasing share of renewable energy in the national energy mix, due to their relative inflexibility to compensate for fluctuations in the supply of solar and wind energy. Coal-fired plants have a clear advantage in this respect, and as coal prices have dropped, companies have started to take gas-fired plants off the grid (including the modern, CO_2-efficient ones) and even threatened to dismantle them altogether. Companies are now trying to put the government under pressure to

introduce changes to the national energy market model by implementing a so-called capacity system. In such a system the producers of electricity would receive compensation not only for delivering kilowatt hours of electricity but for holding capacity available. This would ensure that companies have an economic incentive to retain the more efficient gas-fired plants and not replace them with "dirty coal", making sure that the government's CO_2 goals are not endangered. To date, the outcome of the struggle is still very uncertain.

In the U.S., over 20 GW of coal-fired electricity generation has been prematurely shut down since 2009

Another example is the U.S. market. The U.S. shale gas bonanza has pushed down U.S. gas prices, making coal-fired generation less competitive. The proportion of shale gas in total U.S. gas production grew from 1% in 2000 to 20% in 2010, and the U.S. Energy Information Administration (EIA) expects it could reach 46% by 2035 (EIA, 2012). Coupled with the effects of tightening environmental guidelines, the surge of the U.S. shale gas supply has led to the mothballing of over 20 GW of coal-fired electricity generation in the U.S. since 2009, with an additional 31 GW expected to be stranded over the next ten years (Fleischman et al., 2013). The prospect of carbon regulation is likely to further accelerate this trend.

ESG Performance

There is a strong consensus amongst all stakeholders that utility companies ought to manage their externalities. As the sector has been exposed to pollution issues from the early days of modern environmentalism, utility companies were often early adopters of related measures of prevention and treatment. Nevertheless, despite such preparatory measures, there is growing concern that the Utilities sector's business activities may not be adapting quickly enough. Sustainalytics' assessment of the performance of the sector rests on three main pillars:

Preparedness: 28% weight

(1) An evaluation of the *Preparedness* of companies within the sector to manage Emissions, Effluents and Waste-related challenges. As shown in the table below, five indicators are used to measures companies' performance on this front: Environmental Policy; Environmental Management System; Hazardous Waste Management; Air Emissions Programmes; and GHG Reduction Programmes. This analysis represents 28% of a company's overall assessment.

Qualitative Performance: 43% weight

(2) A *Qualitative* assessment of companies' controversy track record. This analysis looks at the extent to which companies have been involved in significant negative controversies. A single indicator, Operations Incidents, is used to measure companies' Qualitative Performance. It represents 43% of a company's overall assessment.

Quantitative Performance: 29% weight

(3) A *Quantitative* assessment of companies' exposure to carbon-related risks and opportunities. The three indicators used in this assessment, Carbon Intensity, Carbon Intensity Trend and Energy Mix, represent 29% of a company's overall assessment.

(GHG) Emissions, Effluents and Waste – Related Indicators

Related Indicators	Dimen-sion	Key indicator	# companies scoring high	medium	low	Weight in issue
E.1.1 Environmental Policy	Prep		128	53	53	2.2%
E.1.2 Environmental Management System	Prep		119	50	65	8.6%
E.1.3.2 Hazardous Waste Management	Prep	●	2	16	216	6.5%
E.1.3.3 Air Emissions Programmes	Prep	●	11	26	191	6.5%
E.1.7 GHG Reduction Programmes	Prep	●	59	12	162	4.3%
E.1.9 Carbon Intensity	QuantP		31	27	60	4.3%
E.1.10 Carbon Intensity Trend	QuantP		6	36	76	4.3%
E.1.12 Operations Incidents*	QualP	●	217	12	5	43.2%
E.3.1.17 Energy Mix	QuantP	●	28	9	138	20.1%

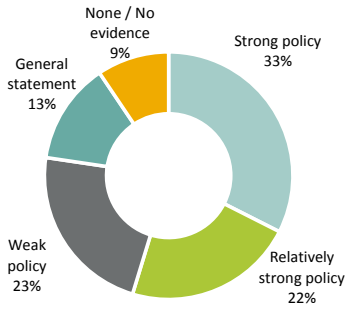
* Includes only Emissions, Effluents and Waste related controversies. High: no controversies or level 1 controversies; medium: level 2 controversies; low: level 3–5 controversies

Source: Sustainalytics

Policies and Programmes

Environmental policies are important in the Utilities sector due to the (generally) high degree of regulatory oversight facing utilities, the large environmental footprint associated with electricity production and the growing strategic importance of managing corporate environmental performance. While environmental policies should not be confused with actual policy implementation, they often provide insightful glimpses into a company's overarching environmental strategy. In the Utilities sector, environmental policies typically cover greenhouse gas emissions and air pollutants as well as hazardous waste and water management.

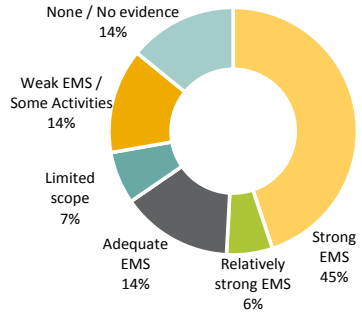
E.1.1 Environmental Policy



Of the 234 utilities companies in our coverage universe, 76 (or 33%) have developed what Sustainalytics considers to be a strong Environmental Policy, which consists of a detailed and comprehensive statement about an organisation's overall approach to environmental management. A further 52 companies (22%) are considered to have a relatively strong policy, and 53 utilities (23%) have at least a weak policy. The group of 53 companies classified to have a "low" score in the table above consists of two sub-groups: 31 companies (13% of our coverage universe) offer a generic statement about environmental management, and 22 (9%) do not disclose any environmental policy. Most of these companies, however, are constituents of the Water Utilities and Independent Power Producers & Energy Traders sub-industries (according to GICS), which we consider to be less exposed to environmental risks than Electric Utilities.

An Environmental Policy may set the tone for an organisation's overarching environmental strategy, but ultimately it is implementation of the policy that matters most in the context of environmental risk management. An Environmental Management System (EMS) is one of the key mechanisms that organisations use to operationalise corporate environmental policy. A disciplined EMS can significantly reduce the probability of costly environmental accidents for utilities operators, as they include specific processes for monitoring environmental performance information, training personnel and complying with relevant laws. As a sector best practice, utilities certify their EMS to external standards including, most importantly, the ISO 14001 series.

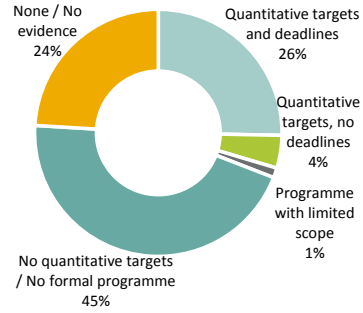
E.1.2 Environmental Management System



Of the 234 utilities in our coverage universe, 105 (45%) have a strong EMS in place, 14 (6%) have a relatively strong EMS and 34 (14%) have an adequate EMS. The difference between these EMS categories relate to scope, the extent to which audits are used and the use of performance targets. At the other end of the spectrum, 29 companies (12%) have what Sustainalytics considers to be a weak EMS, while 33 (14%) either do not have an EMS or do not provide any evidence for having one. Hong Kong (60%) and China (50%) have the highest proportion of utilities without an EMS, suggesting that utilities based in these regions may face a significantly higher degree of operating risk.

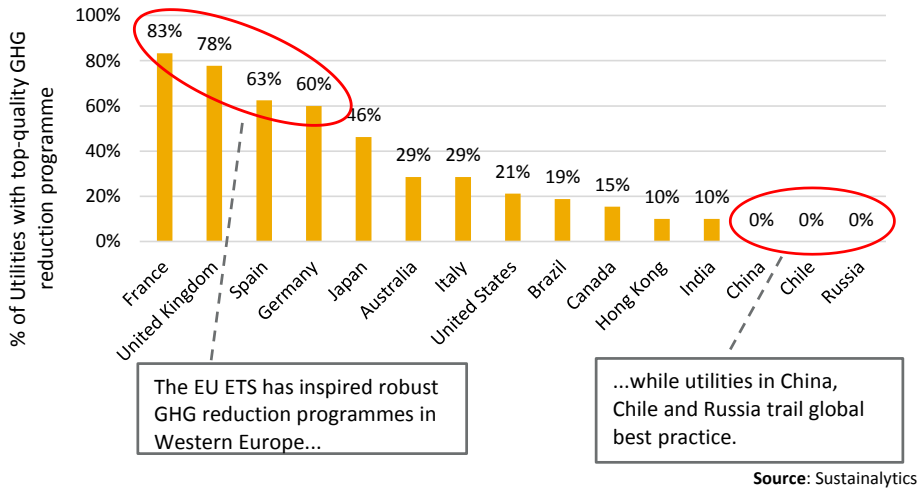
As discussed above, GHG regulation is a growing material concern for companies in this sector. One step utilities can take to reduce their gross exposure to carbon regulatory risk is to reduce their absolute level of GHG emissions or improve their emissions efficiency. These improvements can also yield financial benefits in the form of reduced energy expenditures. Same-sector peers that are more carbon efficient may also be better positioned to compete in regulatory regimes, including the EU ETS. As mentioned above in the Industry Trends section, mechanisms to put a price on carbon have been implemented in 40 countries and 20 sub-national jurisdictions.

E.1.7 GHG Reduction Programmes



Most of the utilities in our coverage universe have developed a GHG Reduction Programme, although the quality of the disclosed programmes varies substantially. Of the 234 utilities in our coverage universe, 59 (or 26%) have set up a high-quality GHG Reduction Programme, characterised by clear reduction targets and deadlines. Nine companies (4%) have implemented a programme with targets but no deadlines, and a mere three (1%) have a programme that covers less than 50% of their operations. A total of 107 companies (or 45%) report a programme with no targets or deadlines, while 55 companies in our universe of 234 (24%) do not report any type of GHG Reduction Programme. The figure below shows that high-quality GHG Reduction Programmes are most prevalent at utilities based in Western Europe and least prevalent at utilities based in China, Chile and Russia.

Proportion of Utilities with a High-Quality GHG Reduction Programme, by Country



Source: Sustainalytics

Controversies – Overview

Only four companies in our coverage universe of 234 have suffered a significant controversy related to (GHG) Emissions, Effluents and Waste since 2011

Of the 234 companies in our coverage universe, five had significant controversies related to (GHG) Emissions, Effluents and Waste (Category 3 to 5) between 2012 and 2015. Most of the controversies were related to the accidental release of environmental contaminants and exposed the companies involved – **Duke Energy Corporation**, **United Utilities Group**, **TEPCO, GDF Suez and Companhia de Saneamento Basico do Estado de Sao Paulo** – to significant negative investor sentiment and longer-term reputational challenges. Four of the five companies are based in developed markets, and the controversies themselves occurred at facilities located in developed markets, including the U.S., U.K., Japan and Australia.

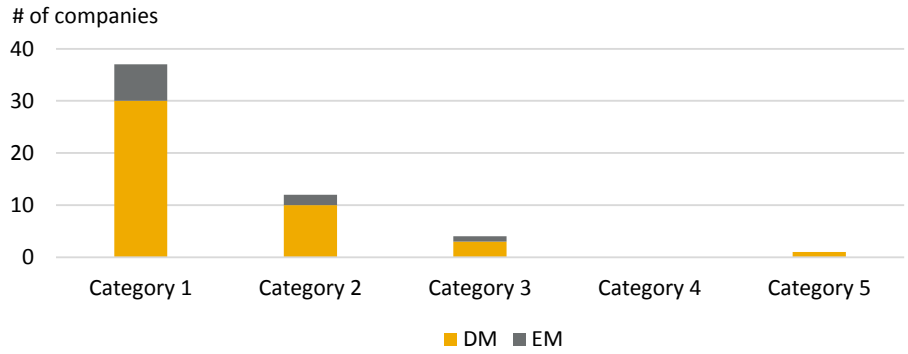
Many utility operators have been criticised for inadequate water impact assessment and mitigation designs

Water-related controversies have also been a source of reputational concern for utilities operators, particularly in relation to dam construction. Mega-structures, such as China's 22,500 MW Three Gorges Dam project, can have negative effects on regional ecosystems. Many utility operators have been criticised for inadequate water impact assessment and mitigation designs, including **Centrais Elétricas Brasileiras S.A. – Eletrobras** (Brazil), **Empresa Nacional de Electricidad SA Chile** (Chile), **Enel** (Italy), **Statkraft** (Norway), **NHPC** (India) and **RusHydro** (Russia). Beyond local community impacts, large dam projects can have negative effects on the water quality of connected river systems.

Severe controversies are often related to water issues

An additional 49 utility companies, or 21% of our industry universe, were involved in low to moderate (Category 1 and 2) controversies related to (GHG) Emissions, Effluents and Waste between 2012 and 2015. Risks at such category levels are by definition not significant, as the scale of damages is relatively limited, and penalties are not typically punitive. Most companies suffering a Category 1 or 2 controversy hail from developed markets, which may reflect the fact that utilities in these regions tend to face a higher degree of regulatory scrutiny than utilities in most emerging markets. The majority of companies in our coverage universe (180, or 77%) have not faced any controversies in this area in recent years.

(GHG) Emissions, Effluents and Waste – Related Controversies



Source: Sustainalytics

5

Category 5 – Severe

Tokyo Electric Power Co Inc. (TEPCO)

Most Severe Controversies

The Fukushima nuclear disaster of March 2011 stands out as a particularly damaging controversy, from both a company-specific and industry standpoint. Although the plant was owned and operated by a single company, **TEPCO**, the incident sent a shockwave through the global power production industry and prompted several countries, including Germany, to reconsider their nuclear energy commitment. The disaster occurred when the plant was hit by a tsunami, which caused the plant's cooling systems to fail and ultimately led to partial reactor meltdown in three of the plant's six nuclear reactors. Before the incident, TEPCO's nuclear reactors generated 26% of Japan's total electricity output of 65 GW. The Fukushima Nuclear Accident Independent Investigation Commission later determined that TEPCO had failed to meet basic safety requirements in connection with the meltdown. While the incident was less severe than the Chernobyl accident of 1986, Fukushima triggered broad discussions and reviews about nuclear reactor safety, regulatory and technological designs, cost calculations of the nuclear power industry and the management of risks related to environmental externalities. At the time of writing, TEPCO had still not succeeded in stopping radioactive water from the No. 2 reactor at the company's Daiichi plant from accumulating in underground tunnels (Japan Times, 2014). While TEPCO's market value has recovered somewhat in recent months, we are concerned that the company's handling of the incident may expose shareholders to further losses and long-term reputational challenges.

Leaders & Laggards

The spread between the best- and worst-performing companies with respect to our key ESG issue (GHG) Emissions, Effluents and Waste is substantial. European high performers **Acciona**, **Verbund**, **Snam** and **Suez Environment Company** and U.S.-based **Exelon** all have extensive environmental management systems in place and offer their stakeholders comprehensive and timely public disclosures about their strategy for managing the issue. Apart from a single Category 1 event incurred by Exelon, these utilities have not endured any controversies in this area over the past three years, a clear indication of their advanced management practices and reduced risk profile for investors.

Our most serious concerns are reserved for **TEPCO**, which continues to struggle with cleanup and operational issues stemming from the 2011 Fukushima nuclear disaster. **Reliance Power**, **UGI Corp**, **Companhia de Saneamento Basico do Estado de Sao Paulo** and **Open Joint-Stock Company RusHydro (RusHydro)** are resolute underperformers, due to their failure to keep pace with disclosure trends in the sector and poor performance relative to peers on a range of quantitative indicators. The table on the next page lists groups of leaders and laggard companies. We find little evidence suggesting that the size of a company, as measured by market cap, is indicative of the overall performance regarding this key issue.

Leaders & Laggards – (GHG) Emissions, Effluents and Waste (DM vs. EM)

Leaders (DM)	Country	Mcap (USD m)	Score EE&W	Score Overall
Acciona SA	Spain	3,777	88.7	84.1
Verbund AG	Austria	7,780	86.5	78.6
Exelon Corporation	United States	24,798	86.1	75.9
Snam SpA	Italy	18,960	85.1	78.6
Suez Environnement Company SA	France	9,407	84.5	78.0

Leaders (EM)	Country	Mcap (USD m)	Score EE&W	Score Overall
ELETROPAULO-Metropolitana	Brazil	603	76.3	77.8
Companhia Energética de Minas Gerais S.A.	Brazil	7,201	75.7	74.8
AES Tiete S.A.	Brazil	2,638	73.3	75.8
CPFL Energia S.A.	Brazil	7,068	71.7	75.9
Empresas Publicas de Medellin E.S.P.	Colombia	n.a.	68.3	70.0

Laggards (DM)	Country	Mcap (USD m)	Score EE&W	Score Overall
Tokyo Electric Power Co. Inc.	Japan	7,329	12.3	35.0
EWE AG	Germany	n.a.	37.5	49.7
Duke Energy Corporation	United States	50,033	38.7	63.2
GDF Suez SA	France	54,681	42.6	64.2
Ameren Corporation	United States	9,229	44.6	61.0

Laggards (EM)	Country	Mcap (USD m)	Score EE&W	Score Overall
Reliance Power Limited	India	2,766	29.7	49.2
Companhia de Saneamento Basico	Brazil	6,595	30.8	61.4
Open Joint-Stock Company RusHydro	Russia	4,972	32.3	53.4
Beijing Jingneng Clean Energy Corp.	China	2,690	33.3	46.6
Manila Electric Co.	Philippines	6,417	34.7	45.6

Source: Sustainalytics, Capital IQ

Outlook – Game-changing potential

Baseline: moderate

Outlook: negative

Across the sector, our key ESG issue (GHG) Emissions, Effluents and Waste will remain a material subject going forward. Emissions regulations will likely play a continued role in shaping the competitiveness of utilities players. Efforts to put a price on carbon are now present in 40 countries and 20 sub-national jurisdictions, and utilities are covered in virtually all of these pricing schemes. Rather than voluntary schemes, formal regulations such as the EU ETS will be the main driver in influencing utilities' conduct.

However, industry challenges come not only from regulatory sources but also from shareholders. An increasing number of investors are concerned with utility companies' long-term plans to address (GHG) Emissions, Effluents and Waste issues. Investors are demanding more and better disclosures around utilities' preparedness for climate change-related regulatory changes. Shareholder resolutions asking key questions about exposures to climate change have been filed in recent months at numerous utilities, including **AES**, **California Water**, **Dominion Resources**, **Southern Company**, **Ameren** and **FirstEnergy**.

Many investors are becoming increasingly concerned about the so-called "carbon bubble" and the risk of stranded assets in the Utilities sector. Ever-stringent regulatory requirements may limit the performance of unprepared utility companies.

More broadly, we are concerned about the lack of robust efficiency programmes covering non-GHG air pollutants, water and waste. The sector additionally entails controversies over nuclear power. Fifty-two of the utility companies in our coverage universe of 234 are involved in civilian nuclear power generation or related services. While nuclear power is heralded as a low-carbon technology, concerns about safety, waste disposal and public sensitivity generate significant reputational exposure for nuclear players. Newer generations of reactors have become progressively safer, yet radioactive waste continues to accumulate, and decisions on nuclear power are highly politicised. Whether or not nuclear plants become stranded, as it is the case already in Germany, depends largely on political leadership, though some utilities such as **Hydro-Quebec** and **Entergy** have voluntarily retired from the space.

Community Relations – Proactive management is key to success

Effectively managing community relationships is an indispensable precondition for long-term financial success in the Utilities sector. The high-impact nature of the sector, characterised by investment in long term assets such as power plants, dams and other infrastructure, creates significant potential for community disruption, which can lead to project delays, increased permitting costs and challenges to a company's social licence to operate. Leading firms in this sector have set up management systems to identify key stakeholders, address community concerns in project planning and monitor stakeholder reactions throughout the asset life cycle. Generic approaches to stakeholder management, such as those based on the precautionary principle, cannot by themselves mitigate the full spectrum of possible community conflicts in the Utilities sector.

Sustainability Impact

The day-to-day operation of utility assets can have significant impacts on surrounding communities

The Utilities sector is predisposed to developing long-term, capital intensive assets including power plants, dams, transmission lines and converter stations, as well as sewage networks and waste disposal facilities. The construction and day-to-day operation of these assets can have significant social and environmental impacts on surrounding communities, with potentially high impacts related to Air Quality, Land, Water Availability and Human Rights, as shown once again in the table below (which is an extract of the table on page 24).

Areas of Sustainability Impact

	Areas of Sustainability Impact														
Key ESG Issue	GHG Levels	Air Quality	Land	Water Quality	Water Availability	Biodiversity	Animal Welfare	Local Communities	Customers	Empl. Health & Safety	Labour Rights & Conditions	Contractors & Supply Chain	Human Rights	Society
Community Relations		●	●	●	●	●		●			●	●	●	●

● low impact ● medium impact ● high impac

Source: Sustainalytics

Pollutants released by utilities can have damaging effects on air quality, local ecosystems and human health

As discussed above, utilities produce a wide variety of air pollutants, including: greenhouse gases; nitrogen oxides (NOx); sulphur oxides (SOx); particulate matter; carbon monoxide; and mercury. These substances can have significant effects on air quality, local ecosystems and human health, and can cause or exacerbate lung irritation, acute respiratory illness in children, cardiovascular disease and dyspnea. The level of air pollution at any given utility operation depends on a variety of factors, including the utility's method of electricity generation and the breadth of local regulations.

Large-scale utility projects can significantly affect the welfare of local communities in other ways. Power plant construction, for instance, typically involves an influx of heavy equipment and temporary workers, which can place a substantial burden on local infrastructure and lead to general community disruption. Empirical research conducted in the U.S. recently found that neighbourhoods within two miles of newly opened

power plants experienced a 3-7% decrease in housing value and rents with some evidence of larger decreases within one mile and for high-capacity plants (Davis, 2010).

"Not in my backyard": balancing local community interests against the greater good

A current example of local rebellion against large-scale utility projects can be observed in Germany. As a part of the so-called "Energiewende", through which Germany is increasing the share of renewables in the national energy mix, a new backbone of power grid infrastructure is being erected. The new infrastructure primarily consists of new high-performance direct current lines, primarily needed to transport wind energy from northern parts of the country and off-shore facilities to the south. Although large parts of the German population support the project, at the local level there is a lot of resistance against it. This "not in my backyard" or "NIMBY" phenomenon is certainly well known in other contexts as well. In this particular case, however, it shows that not everything that is desirable from an overall societal perspective – we assume this to be the case in the example given – is easily implementable and enforceable in constitutional democratic societies. The German government has decided to try to reconcile or balance divergent interests by starting complex and extensive stakeholder engagement processes. Whether these will catalyse the finding of a consensus solution remains to be seen.

Forced resettlement is a highly contentious issue in the Utilities sector

Utility projects may also be associated with forced relocation and population resettlement. Forced resettlement is a highly contentious issue in the Utilities sector and, while not commonly associated with power plant construction in either emerging or developed markets, nevertheless represents a grave concern for corporates and investors. Several utilities in our coverage universe have been implicated in episodes of forced relocation, often in collaboration with local governments or government forces. Thailand-based **Ratchaburi Electricity Generating Holding Public Company**, for example, faced substantial reputational damages due to its recent investment in a controversial hydroelectric dam project on the Salween River in eastern Myanmar (Wangkiat, 2014).

Indigenous peoples have internationally protected rights to preserve their way of living

The invasive nature of power plant development underscores the need for utilities to establish proactive engagement processes. As a best practice in stakeholder engagement, particular attention is paid to vulnerable constituents, including indigenous peoples, communities based in areas of historic or archaeological significance and civilians in zones of armed conflict.

Another key area of sustainability impact relates to universal access to electricity and clean water. While many utilities have endorsed the principle of providing a secure supply of electricity, access to the sector's services is far from universal. While lack of electricity and clean water is felt most acutely in emerging markets, the emerging notion of "fuel poverty" on the back of rising retail utility and fuel charges has taken hold in several developed markets as well (Read, 2014).

Business Impact

PG&E was fined USD 1.4bn by California regulators in September 2014

Community Relations can impact utilities' bottom line in a variety of different ways. On the one hand, the sector is highly exposed to litigation risk in its role as a developer and operator of large-scale assets such as power plants, dams and pipelines. While typically subjected to ongoing safety tests by regulators, these assets are prone to operational accidents that can have severe health and ecosystem impacts for local communities. Even in the absence of accidents, a utility's day-to-day operations under business-as-usual conditions can lead to a pronounced "not in my backyard" reaction from local communities. Operational mishaps can lead to charges against responsible companies in both the criminal and civil courts. A notable example occurred in September 2014 when PG&E was fined USD 1.4bn by California regulators in relation to a 2010 gas pipeline explosion in a San Francisco suburb (Sweet, 2014). While the case had not been settled at the time of writing, it illustrates the scale of exposure to litigation risk that utilities face.

Secondly, Community Relations can have material business impacts for utilities companies through operational risk, specifically related to project development. In today's business environment, particularly in developed markets, it is virtually impossible for utilities to construct long-term utility assets such as power plants or dams without first conducting formal community consultation. While the depth and scope of this process varies dramatically from country to country, features usually include stakeholder identification, monitoring programmes and mechanisms to address community concerns over the asset life cycle.

Failure to adequately engage local communities can lead to increased project cost

It is widely understood in the Utilities sector that failure to adequately engage local communities can lead to increased project cost, permitting delays and longer-term challenges to a company's social licence to operate. When GDF Suez, a French multinational utility, failed to properly consult with indigenous groups living near the company's USD 8bn Jirau hydroelectric dam in Brazil, the company's costs to accommodate the groups in project planning swelled to USD 500m, up from the company's original estimate of USD 230m (Nielsen, 2013).

Community activism is far more professionalised than in the past

Improper management of community relations can also lead to direct asset risks, including asset sabotage, the blockading of facilities or logistical supplies, worker strikes and property theft. Of course, even excellent community programmes cannot rule out these risks entirely, but exposure can be reduced with advanced practices. Community activism, as a whole, is far more professionalised than in the past. Protest groups often have an enterprise-like organisational profile with expert staff and network with other activist organisations. Where utilities conduct businesses with low social trust, operating costs will rise because of, among other things, the contracting of private security companies to protect company assets. This can create sensitive situations. As summarised in the table below, we've identified three areas of potentially severe business impact: Litigation Risks, Asset Risks and Operational Risks.

Areas of Business Impact

Areas of potentiall high business impact comprise: Asset Risks, Operational Risks, and Litigation Risks

	Areas of Business Impact							
Key ESG Issue	Regulatory Environment	Litigation Risks	Reputation Risks	Client Demand	Asset Risks	Operational Risks	Employee Motivation	Hiring Capability
Community Relations	●	●	●		●	●	●	●

● low impact ● medium impact ● high impac

Source: Sustainalytics

ESG Performance

Determining the extent to which individual utilities are exposed to community-driven risk is an increasingly important component in modern valuation models for the sector. Sustainalytics' methodology for measuring utilities' Community Relations performance rests on three main pillars.

Preparedness: 50% weight

(1) An evaluation of the *Preparedness* of companies within the sector to manage Community Relations-related challenges. As shown in the table below, four indicators are used to measures companies' performance on this front: Bribery & Corruption Policy; Whistleblower Programmes; Community Involvement Programmes; and Access to Basic Services. This analysis collectively represents 50% of a company's overall assessment.

Qualitative Performance: 45%

(2) A *Qualitative* assessment of companies' controversy track record. This analysis looks at the extent to which companies have been involved in significant negative controversies related to Community Relations. A single indicator, Society & Community Incidents, is used to measure companies' controversy performance. It represents 45% of a company's overall assessment.

Quantitative Performance: 5% weight

(3) A *Quantitative* review of companies' exposure to community risks. A single indicator, Activities in Sensitive Countries, is used to gauge a company's performance. It carries a weight of 5% in a company's overall assessment.

Community Relations – Related Indicators

Related Indicators	Dimension	Key indicator	# companies scoring high	# companies scoring medium	# companies scoring low	Weight in issue
G.1.1 Bribery & Corruption Policy	Prep		62	109	63	10.0%
G.1.2 Whistleblower Programmes	Prep		32	141	61	20.0%
S.4.1 Activities in Sensitive Countries	QuantP		226	3	5	5.0%
S.4.2.2 Community Involvement Programmes	Prep	●	18	76	140	10.0%
S.4.2.10 Access to Basic Services	Prep		33	22	61	10.0%
S.4.3 Society & Community Incidents*	QualP	●	185	23	10	45.0%

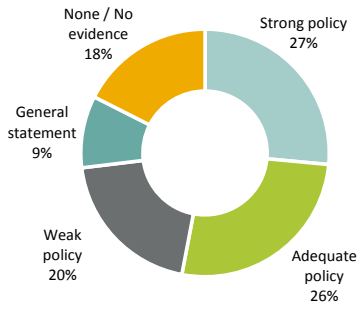
* Includes only Community Relations controversies. High: no controversies or level 1 controversies; medium: level 2 controversies; low: level 3–5 controversies

Source: Sustainalytics

Policies and Programmes

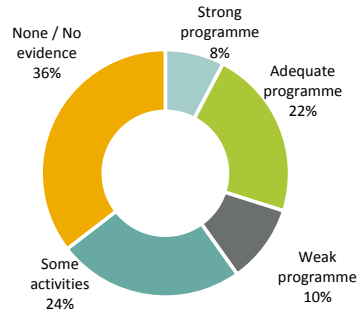
While Bribery and Corruption Policies do not fully reflect a company's overall positioning on Community Relations-related risks and opportunities, they form part of an effective stakeholder engagement strategy. These policies often serve to regulate the conduct of management and employees, particularly at tenders, licence negotiations and mergers and acquisitions (M&As). Companies with a strong stance on

G.1.1 Bribery & Corruption Policy



bribery and corruption may be less likely to run into reputational problems or costly lawsuits related to bribing community leaders. An effective policy on bribery and corruption also provides clear guidelines to employees about acceptable and unacceptable conduct, which can help employees identify potentially harmful practices. Of the 234 utilities in our coverage universe, 62 (27%) have a strong Bribery and Corruption Policy in place, while 41 companies (18%) do not disclose any type of policy or statement covering bribery and corruption. Just under half of these 41 companies are based in developed markets, including Australia, France, the U.K. and the U.S., where bribery policies have long been a regular component of corporate governance strategies.

S.4.2.2 Community Involvement Programmes



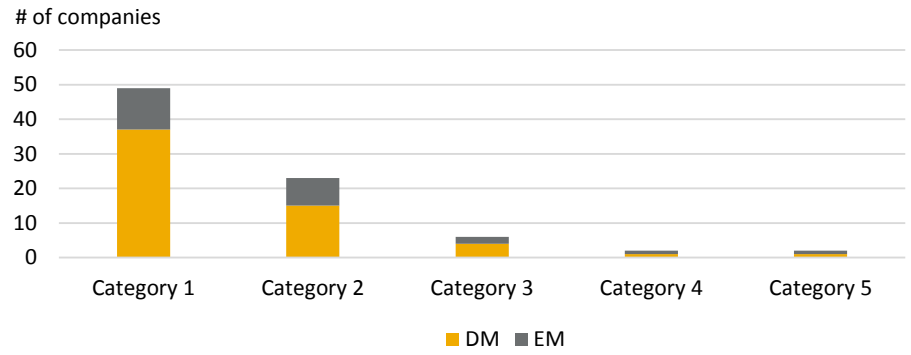
Community Involvement Programmes are one of the most important mechanisms that utilities can use to formally assess and integrate community concerns into project planning. While there are other channels for addressing community aspirations, community programmes can be a very important tool for identifying potential conflict areas. As a best practice for the sector, programmes involve clear responsibilities, grievance measures and oversight mechanisms and are supported by executive management. Against this backdrop, we were surprised to discover that 83 companies in the sector (or 36% of our coverage universe) either have not developed any Community Involvement Programmes or do not disclose such programmes. These 83 companies are dispersed across both developed and emerging markets, and may be more exposed to stakeholder risks going forward than peers with well-conceived community programming. Stakeholder mismanagement in this sector can lead to full-scale controversy, creating negative impacts on shareholder value and a company's social licence to operate.

Controversies – Overview

Of the 234 companies in our coverage universe, 10 have been implicated in significant controversies (Category 3 to 5) related to Community Relations since 2011. Controversies range from violent protests over transmission line projects and concerns over nuclear safety to community poisoning as well as health and safety violations. Incidents in EM regions may have additional elements, such as human rights abuses and violations of international sanctions. As discussed in more detail below, these incidents have caused and continue to cause severe reputational challenges for the companies involved. An additional 72 companies endured community controversies of a less significant nature (Category 1 and 2).

Community Relations – Related Controversies

Of the 234 companies in our coverage universe, 10 have been implicated in significant controversies (Category 3 to 5)



Source: Sustainalytics

Most Severe Controversies

5

Category 5 – Severe

TEPCO,
Eletrobras
NHPC

In addition to causing sustained controversy from an Emissions, Effluents and Waste standpoint, the Fukushima disaster exposed **TEPCO** to a variety of highly problematic Community Relations controversies. The 20 kilometre (km)-radius exclusion zone set up by TEPCO and Japanese authorities ended up displacing over 300,000 people. Farming and fishery cooperatives, small business and municipalities sought compensation for costs related to product contamination and reputational damages. In many cases, the products of surrounding businesses have suffered irreversible reputational damages, as their products are frequently rejected even though they meet public health standards.

Since the onset of the incident, the company has withdrawn all community engagement policies, and frequent allegations are made of the company's lacklustre and insincere processing of claims by victims. While **TEPCO** vies to reopen other idling nuclear power plants, regulators have repeatedly criticised its lack of accountability. Final civil compensation claims could eventually stand at USD 34bn, although the effective nationalisation of the company by the Japanese government may insulate other shareholders from these claims.

Belo Monte dam: Local courts have sought to halt the project, citing improper due process and the lack of involvement of indigenous communities

Eletrobras, the large Brazilian electric utility that generates about 40% of the country's power supply, has also been involved in a severe controversy tied to Community Relations in recent years. Eletrobras is the chief owner and operator of the controversial Belo Monte dam, located in the Altamira region of northern Brazil. Upon completion, which is expected in 2016, the dam will be the third-largest hydroelectric dam in the world. Over 20,000 people living in the Altamira region have reportedly been displaced as a result of the dam's construction (Hagler-Geard, 2012). It is expected that the dam will ultimately flood over 500 km^2 of forested land, further affecting local ecosystems and community groups. Local courts have sought to halt the project, citing improper due process and the lack of involvement of indigenous communities.

In 2011, the Inter-American Commission on Human Rights advised an immediate suspension, based on the absence of free, prior and informed consent of stakeholders (International Rivers, 2011). The parliament is also probing the use of internal migrant workers and allegations of slavery (Jagger, 2013). While Eletrobras has generally strong

community programmes in place, related programmes and policies have been overwhelmed, and the company is not addressing or mitigating project impacts through continuous monitoring and consultation. An additional factor has been the Brazilian president Dilma's determination to complete the dam, which has put political pressure on Eletrobras to speed up development of the asset.

NHPC's dams have faced persistent community opposition due to the alleged forced displacement of villagers by Myanmar's national army

In EM regions, complicity in human rights violations often coincides with high-impact projects. India's **NHPC** is the main developer of two large dams along the Chindwin River in western Myanmar. The dams have faced persistent community opposition due to the alleged forced displacement of villagers by Myanmar's national army. Collaboration with the army, which has a history of human rights violations against civilians, makes the company complicit in its actions. The dams are located in regions where insurgency and civil unrest are reported. **NHPC** is neither a signatory to the U.N. Global Compact, nor does it have policies for community engagement and resettlement. Although Myanmar began transitioning to a civilian government in 2012, it still lacks human rights regimes and is under partial international sanctions. Nevertheless, a temporary suspension of the two dams was instituted in 2013, making the future of these high-impact projects uncertain.

Leaders & Laggards

Disconnect between the materiality of community issues and the sector's relatively poor performance

The gulf between leaders & laggards with respect to community and stakeholder strategies is considerable. At the sector level, improvements have been slow, and issue identification has proven to be difficult. The disconnect between the materiality of community issues and the sector's relatively poor performance developing sophisticated community programmes is revealing and may speak to the sector's historic conservatism and lack of innovation. Due to the absence of industry-wide initiatives related to this key ESG issue, individual companies often establish their own approaches or make use of thematic assessment tools such as those of the London Benchmark Group or the World Business Council on Sustainable Development. While the corporate learning process has been sluggish, there is growing interest in the topic of Community Relations, and we expect further development of sector capabilities over the short run, particularly for DM utilities that have projects in EM countries.

The company identified Community Relations as a critical factor to its business and subsequently established community and local impact policies

Among the leaders, **Centrica** stands out as the top performer. Centrica belongs to Britain's "Big Six" utility firms, which have been involved in community conflicts related to infrastructure and rapidly rising retail prices. The company identified Community Relations as a critical factor to its business and subsequently established community and local impact policies on fuel poverty, access to education, skills development and social exclusion. Centrica prioritises the identification and support of households in need with a tailored range of services, including energy efficiency, debt alleviation and priority service. Typical for such programmes, Centrica works with public and voluntary sector partners to provide financial assistance and support. The programme was extended to 2.1 million British customers considered socially vulnerable, and the company's North American branches have their own funding and collaboration programmes in Canada and the U.S.

Leaders & Laggards - Community Relations (DM vs EM)

Leaders (DM)	Country	Mcap (USD m)	Score CR	Score Overall
Centrica plc	United Kingdom	27,109	100.0	78.0
TERNA - Rete Elettrica Nazionale Societa per Azioni	Italy	10,090	99.5	85.4
Sempra Energy	United States	22,399	97.0	78.9
Verbund AG	Austria	7,780	97.0	78.6
American Water Works Company, Inc.	United States	7,647	97.5	72.0

Leaders (EM)	Country	Mcap (USD m)	Score CR	Score Overall
Enersis S.A.	Chile	14,223	94.7	67.6
Brookfield Renewable Energy Partners LP	Bermuda	7,481	87.4	65.8
Empresa Nacional de Electricidad SA Chile	Chile	11,250	87.1	70.2
Companhia Paranaense de Energia	Brazil	2,522	83.5	74.0
Empresa de Energia de Bogota S.A. ESP	Colombia	6,436	83.5	64.8

Laggards (DM)	Country	Mcap (USD m)	Score CR	Score Overall
Tokyo Electric Power Co. Inc.	Japan	7,329	25.0	35.0
Electric Power Development Co. Ltd.	Japan	4,456	47.1	67.2
Vier Gas Transport Gmbh	Germany	n.a.	50.0	54.7
SGSP (Australia) Assets Pty Ltd.	Australia	n.a.	52.5	51.8
AusNet Services	Australia	3,836	52.5	59.3

Laggards (EM)	Country	Mcap (USD m)	Score CR	Score Overall
Gail India Ltd.	India	7,200	19	60.6
Ratchaburi Electricity Generating Holding Public Co. Ltd.	Thailand	2,228	21	46.4
Guangdong Electric Power Development Co. Ltd.	China	3,274	30	52.5
Petronas Gas Bhd	Malaysia	13,685	32	47.9
NHPC Ltd.	India	3,629	32	46.8

Source: Sustainalytics, Capital IQ

Baseline: weak

Outlook: neutral

Outlook – Rising social and regulatory pressure

Over the years, a number of DM utility companies have developed expertise in managing Community Relations. Yet, the progress in this field has been slower than in most other ESG areas. Best practices are not readily applicable to other cases. Since regulatory requirements provide only minimum obligations, it is unlikely that compliance alone can sufficiently prevent and manage the associated risks discussed above. Gradually, more utility companies will start to adopt international voluntary schemes to address Community Relations more effectively.

Some industry players are boosting the depth of their stakeholder engagement programmes, but many are behind the curve

The sector is recognising that Community Relations is part of its general risk management and business generation. As no utility company can operate without the support of host communities, we expect that more and more utilities will strengthen their dialogue programmes going forward. Community-related issues are never static, and stakeholders will always be concerned about the Utilities sector's potential negative health and community impacts. How the changing business model of the Utilities sector will affect future relationships between companies and communities is uncertain. Utility companies need to have formalised mechanisms not only to understand the contemporary requirements of stakeholders but also to build abilities to learn future sustainability impact vis-à-vis community relations.

Product Sustainability – The new value proposition

Faced with challenges to their conventional business model and changing customer expectations, forward-looking utilities are looking to generate new revenue opportunities by adopting a more customer-focused strategy. Services around energy management and energy efficiency, coupled with investments in smart grid technology and cross-industry collaboration, are helping to diversify the sector's revenue base. Across the sector, many companies are repositioning themselves to be more service oriented, while others are seemingly content to remain a "provider of provisions". The strategic divide in this sector is wide and growing. As companies prepare for the disruptive forces of the Great Transformation, we argue that the ability to innovate and deliver new products and services will be an increasingly important factor in the security selection process for investors.

Sustainability Impact

The Utilities sector is different when it comes to Product Sustainability

The Utilities sector is different from many other sectors when it comes to the key ESG issue Product Sustainability. Electric Utilities, which is the most material sub-industry within the Utilities sector from an investor perspective (e.g. as measured by market cap share), is used to illustrate this point. Product Sustainability in this industry is mainly defined by the way in which the core product is produced, not by the characteristics of the final product itself. For the customer, a kwh of electricity is a kwh of electricity. It is a homogenous good. It becomes "green" only in an indirect sense, i.e. if it has been produced with the help of renewable energy facilities, such as a wind or a solar farm.

Cannabilising the industry's core product has become a part of the new business model

The utility that delivers electricity cannot influence the footprint of the product during its use phase via the characteristics of the product itself. This contrasts with the case of the car maker, to use one example, who sells cars that are more or less fuel efficient and contain differing proportions of recycled materials. In the Utilities sector, the impact during the use phase, i.e. the consumption of electricity, water, gas, etc. can be influenced by a utility company only via the additional services it offers to its customers to help them reduce consumption. And this is another special feature that distinguishes the Utilities sector from others: it has become part of the business model to help customers to reduce consumption, despite the fact that this cannabilises the sector's core business, which is selling commodity goods in large amounts to its customers. This shows that the questions of sustainability impact and business impact are closely intertwined here.

Areas of Sustainability Impact

Before getting deeper into the discussion of the topic, we take a look at the different areas of sustainability impact we have identified as particularly relevant. These are: GHG Levels; Water Availability; Customers; and Society. All are considered as areas of high impact, as shown in the table below.

Areas of Sustainability Impact

Areas of high sustainability impact include GHG Levels, Water Availability, Customers and Society

Key ESG Issue	GHG Levels	Air Quality	Land	Water Quality	Water Availability	Biodiversity	Animal Welfare	Local Communities	Customers	Empl. Health & Safety	Labour Rights & Conditions	Contractors & Supply Chain	Human Rights	Society
	Areas of Sustainability Impact													
Product Sustainability	●	●	●	●	●	●		●	●					●

low impact medium impact high impac

Source: Sustainalytics

Product Sustainability – The recent trends

Many of the new products and services being developed and marketed by utility players offer considerable benefits for society and the environment

Many of the new products and services being developed and marketed by utility companies offer considerable benefits for society and the environment. A growing number of utilities are investing in renewables, including wind and solar photovoltaics, in an effort to diversify their energy mix and re-energise their profile with investors and customers. Renewables offer considerable sustainability benefits over fossil fuel generation, including reduced GHG emissions and air pollutants and improved public health. Renewables also offer the prospect of reduced strain on water resources, as large volumes of water are used in thermoelectric power plants to both generate steam and cool steam that has passed through the plant's turbines.

In addition to bolstering their renewables portfolio, some utilities are moving further down the value chain and helping their customers manage their energy use. These services rely on the growing array of intelligent energy management software products such as smart meters, which can help households and businesses improve energy efficiency and lower costs. Some utilities have gone so far as to help their customers integrate distributed generation technologies, which can improve the long-term economic viability of small-scale power generation.

Smart grid deployment is typically undertaken by utilities in collaboration with government agencies

Further sustainability benefits are found with smart grids. A smart grid is a modernised power grid using digital information as well as computer-based remote control and automation to improve the efficiency of electricity distribution. Given the scale of investment involved, smart grid deployment is typically undertaken by utilities in collaboration with government agencies. The U.S. Department of Energy's Smart Grid Project, for instance, requires matching funding from individual utilities (Smartgrid, 2014). The main benefit of smart grids from a sustainability perspective is that they allow for greater penetration of renewables by improving the "matching" of generation and demand volumes (Brooks, 2014).

In addition to serving as a catalyst for renewable generation, smart grids and related infrastructure benefit conventional power sources. With existing infrastructure, electric utilities plan their baseload power-generating assets to meet "peak demand". During lower-demand periods, they have excess idling capacity that increases their fixed costs. Faster demand response systems enabled by smart grid technology will help companies reduce idle capacity and overhead.

New methods for ensuring safe drinking water have been developed in recent years

For water utilities, a variety of new methods for safe drinking water have been commercialised in recent years, including graphemes, carbon nanotubes and electrodialysis. As water intake structures are regulated in most countries, desalination

technologies offer important sources of drinking water, particularly in rapidly expanding cities in dry regions.

Waste management companies create energy from refuse

The waste management and public sanitation sub-industries approach sustainable services by creating energy and new materials from refuse. Energy from plants is generated by thermal or biological treatment of combustible materials and converted to electricity, heat and fuels. Generators must ensure that waste gases are safe, as they tend to contain more toxins than conventional fuel sources. District heating and co-generation of heat and power have been available for several decades. In recent times, research by utility companies in biofuel has been added to improve the energy potential of synthesised fuel.

Business Impact – The threat of "creative destruction"

We have identified three areas of most significant business impact regarding Product Sustainability as shown in the table below. These include: Regulatory Environment, Reputation Risks and Client Demand.

Areas of Business Impact

	Areas of Business Impact							
Key ESG Issue	Regulatory Environment	Litigation Risks	Reputation Risks	Client Demand	Asset Risks	Operational Risks	Employee Motivation	Hiring Capability
Product Sustainability	●		●	●	●	●	●	

low impact medium impact high impac

Source: Sustainalytics

Those utilities that have demonstrated a capacity for "thinking outside the box" will be best positioned to weather the industry's forthcoming storm

Distributed generation may be a disruptive threat to utilities' business models and financial health, but this has not prevented forward-thinking utilities from developing innovative strategies to compete in the industry's new paradigm. The evolution in product and service development, which includes new services related to energy management and energy efficiency, stands to have major long-term financial effects on utility operators. Indeed, for many utilities, innovation on this front has already provided them with a lifeline (The Economist, 2013). We believe those utilities that have demonstrated a capacity for "thinking outside the box" will be best positioned to weather the industry's forthcoming storm, although a lot will also depend on whether new deals and pricing models can be struck with regulators.

For many utilities, innovation on this front has provided them with a lifeline

While demand for sustainable products is being driven by the rise of distributed generation and shifting customer expectations, fresh opportunities for product and service development are being realised by technological advancements in intelligent software, battery storage, e-mobility infra and big data business modelling. Some utilities are also exploring opportunities related to grid service management.

Some utilities are opting to help their customers integrate distributed generation technologies

In a bid to tap the rapidly expanding market for "homegrown" electricity, some utilities are opting to help their customers integrate distributed generation technologies. Revenue opportunities include installation and advisory fees as well as financing

products. In other cases, utilities are taking equity stakes in solar PV companies, such as Duke Energy's stake in REC Solar.

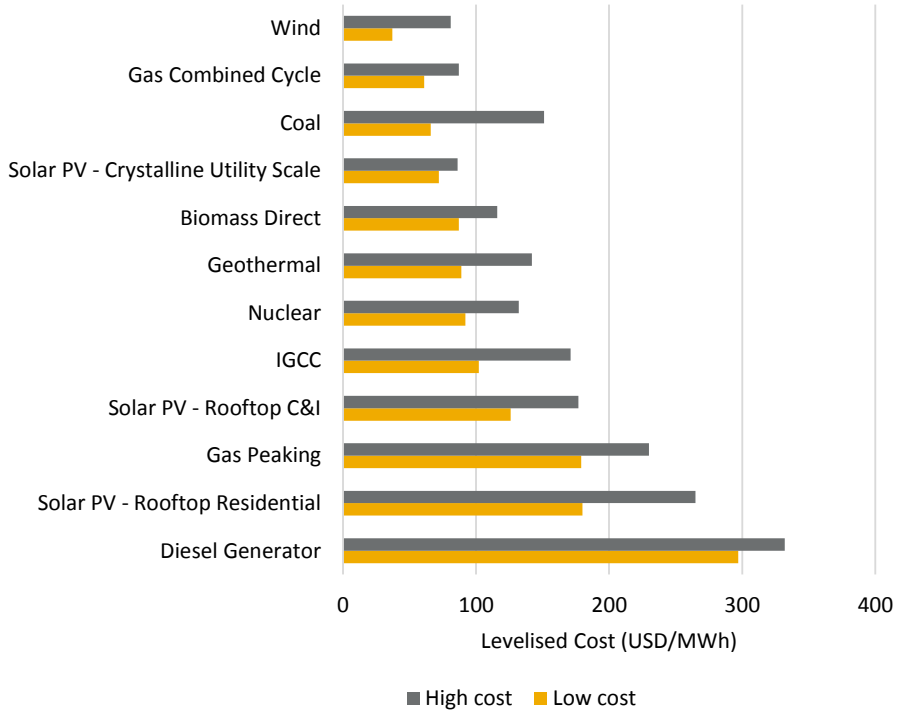
Consumers are demanding a more customised, service-oriented experience from their electricity providers

Municipalities and other large customers are increasingly looking for "clean" electricity to help them meet their own targets and commitments. Retail customers have become more environmentally savvy, preferring utility companies that provide green offers as well as suggestions for creating smart homes. Industrial customers seek opportunities to cut down their operating costs, including utility bills. Utility companies offer sustainability services by promoting more flexible solutions, such as off-peak consumption, enlarged variable components in a contract, efficiency consulting and coordination of multi-stakeholder energy cooperatives within specific industrial parks.

The levelised cost of certain renewable technologies is lower than many conventional power sources

Coupled with the increasingly attractive cost structure of many renewable technologies, consumer preference for sustainable products and services is helping to drive more and more utilities to invest directly in renewable generation. In the U.S., where wind and solar sources are widely deployed, the levelised cost of utility scale solar fell by 78% between 2009 and 2014 (Lazard, 2014). The diagram below shows that the pricing of most renewable energy methods has already entered the higher-end range of conventional fossil fuel combustion costs, signalling that renewable technologies are becoming commercially competitive without subsidies.

Levelised Cost of Selected Alternative and Conventional Energy Technologies



Source: Lazard, 2014

ESG Performance

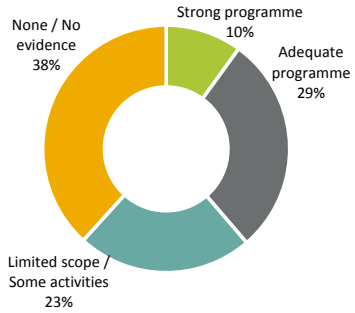
In measuring companies' Product Sustainability performance, we use two indicators: Customer Eco-Efficiency Programmes; and Sustainable Products & Services, each with a 50% weight.

Product Sustainability – Related Indicators

Related Indicators	Dimen-sion	Key indicator	# companies scoring high	medium	low	Weight in issue
S.3.1.11 Customer Eco-Efficiency Programmes	Prep		23	66	141	50%
E.3.1.1 Sustainable Products & Services	QuantP		46	11	177	50%

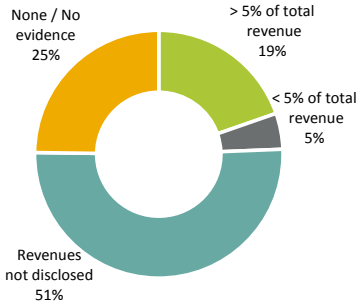
Source: Sustainalytics

E.3.1.11 Customer Eco-Efficiency Programmes



The extent to which utilities are engaging their customers with eco-efficiency programmes is one proxy for their ability to innovate. On the one hand, a rampant and sustained improvement in consumer energy efficiency could lead to lower electricity demand and reduced revenues for utilities operators. On the other hand, such programmes are consistent with the emerging trend towards customised solutions and greater levels of service. Eco-efficiency programmes typically involve target-oriented attempts to help industrial and retail customers improve efficiency, optimise processes and lower costs. Another objective is to shift demand to off-peak hours, which can further help customers to lower costs if time-of-use pricing strategies are in force. Fully 62% of companies within our coverage universe have developed some form of Customer Eco-Efficiency Programme. Of these 146 companies, 93 (64%) are based in DM countries, reflecting the relative inroads that utilities in North America and Europe have made in engaging their customers around energy efficiency.

E.3.1.1 Sustainable Products & Services



Sustainable Products & Services looks at the proportion of utilities' top-line revenue that comes from the sale of products and services that offer explicit environmental or social benefits, including renewable generation, smart grid development and energy management services. A very slight majority of utilities in the sector (119/234 or 51%) do not segment their revenues from a sustainability standpoint. Among the companies that offer a breakdown of their revenues along these lines, 46 (19%) derive more than 5% of their annual revenue from sustainable products, while 11 (5%) report less than 5%. One quarter of the companies in our research universe disclose that they do not offer any sustainable products or services, which illustrates the opportunity for further product development in the industry.

Leaders & Laggards

Top companies in Product Sustainability are linked by a focus on efficiency and big bets on renewables

Top companies in Product Sustainability are linked by a focus on efficiency and big bets on renewables. Japan's **Electric Power Development** is recognised globally for its pioneering efforts in integrated gasification combined-cycle technologies. **Enel Green Power**, part of the Italian Enel Group, specialises in renewable energy: approximately 98% of its power output is driven by hydroelectric, wind, geothermal and solar PV sources. With the definitive shutdown of its nuclear generating station in 2012, **Hydro Quebec's** energy generation composition shifted to 98% renewable. It operates 60 hydroelectric generating stations and 26 reservoirs to maintain an installed capacity of 36,000 MW of electricity, enough to meet local demand and support export to the U.S.

Wholly owned by the Swedish government, **Vattenfall AB** operates the world's largest offshore wind farm at Thanet, U.K., as well as the 100 MW Lillgrund wind farm off the coast of Sweden. In Brazil, Eletrobras' titanic dams are sources of ESG controversy, but the company is forging ahead with hydropower and is the backbone of the country's low-carbon power generation profile.

Leaders & Laggards – Product Sustainability (DM vs. EM)

Leaders (DM)	Country	Mcap (USD m)	Score PS	Score Overall
Electric Power Development Co. Ltd.	Japan	4,456	100.0	67.2
Enel Green Power S.p.A.	Italy	13,440	100.0	75.2
Vattenfall AB	Sweden	n.a.	100.0	77.5
Hera S.p.A.	Italy	3,406	75.0	80.6
EDP-Energias de Portugal, S.A.	Portugal	14,136	75.0	79.2

Leaders (EM)	Country	Mcap (USD m)	Score PS	Score Overall
Centrais Elétricas Brasileiras S.A. – Eletrobras	Brazil	5,299	100.0	67.6
Companhia Energética de Minas Gerais S.A.	Brazil	7,201	75.0	74.8
ELETROPAULO-Metropolitana	Brazil	603	70.0	77.8
CPFL Energia S.A.	Brazil	7,068	70.0	75.9
Tractebel Energia S.A.	Brazil	9,603	70.0	74.8

Laggards (DM)	Country	Mcap (USD m)	Score PS	Score Overall
Dynegy Inc.	United States	2,056	0.0	51.1
Madrilena Red de Gas Finance B.V.	Netherlands	n.a.	0.0	52.0
Algonquin Power & Utilities Corp.	Canada	1,388	0.0	54.2
Vier Gas Transport Gmbh	Germany	n.a.	0.0	54.7
Redexis Gas Finance B.V.	Spain	n.a.	0.0	54.9

Laggards (EM)	Country	Mcap (USD m)	Score PS	Score Overall
JSW Energy Ltd.	India	1,164	0.0	44.1
SPP Infrastructure Financing B.V.	Slovakia	n.a.	0.0	45.1
Huadian Energy Company Limited	China	756	0.0	45.4
Qatar Electricity & Water Company Q.S.C	Qatar	5,376	0.0	46.9
Petronas Gas Bhd	Malaysia	13,685	0.0	47.9

Source: Sustainalytics, Capital IQ

Outlook – Big prize for the innovation winners

Baseline: moderate

Outlook: positive

Innovations in utilities are both incremental and disruptive, and the pace is set to accelerate. Companies can differentiate themselves by developing sustainable products and services. The age of smart utility infrastructure is slowly emerging, yet it is still at its nascent phase. In the new technology-enabled, multidirectional industry landscape, the future of the Utilities sector will largely shift from the centralised provision supply model to a distributed customer-centric service model.

The Utilities sector will shift from the centralised provision supply model to a distributed customer-centric service model

The outlook is positive for companies that prepare for this transformation. This entails a long-term business contraction for conventional power generation. On the other hand, clean energy and retail services will acquire momentum, capitalising on the declining costs and improving efficiency of renewable energy. At a company level, Product Sustainability will have more opportunities in home energy services and off-grid solutions that are based on a new "sustainable services" model.

Indicator Chartbook (DM)

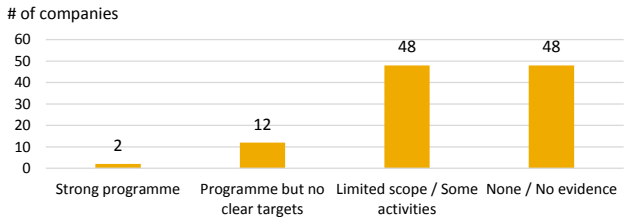
Key Indicators

Indicator	Key ESG issue	Dimension	Weight*	Min	Average	Median	Max
Environment							
E.1.3.2 Hazardous Waste Management	Emissions, Effluents and Waste	Preparedness	3.6%	0	12	0	100
E.1.3.3 Air Emissions Programmes	Emissions, Effluents and Waste	Preparedness	3.6%	0	19	25	100
E.1.7 GHG Reduction Programmes	Emissions, Effluents and Waste	Preparedness	2.4%	0	39	25	100
E.1.12 Operations Incidents	Emissions, Effluents and Waste	QualitativeP	23.8%	0	96	100	100
E.3.1.17 Energy Mix	Emissions, Effluents and Waste	QuantitativeP	11.1%	0	25	0	100
Social							
S.1.6.2 Health & Safety Programmes	Health and Safety	Preparedness	3.3%	0	47	50	100
S.1.7 Employee Incidents	Human Capital	QualitativeP	13.3%	50	98	100	100
S.3.3 Customer Incidents	Sustainable Products and Services	QualitativeP	13.3%	50	97	100	100
S.4.2.2 Community Involvement Programmes	Community Relations	Preparedness	3.3%	0	36	25	100
S.4.3 Society & Community Incidents	Community Relations	QualitativeP	15.0%	0	93	100	100
Governance							
n.a.	n.a.		n.a.		n.a.		n.a.

* Indicator weight within E, S, G

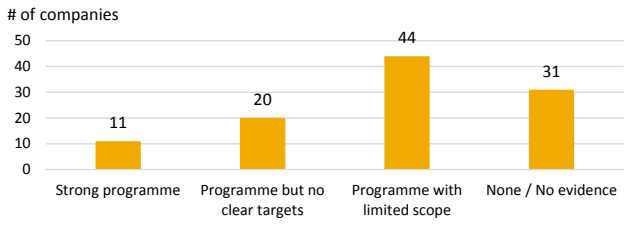
Environment

E.1.3.2 Hazardous Waste Management



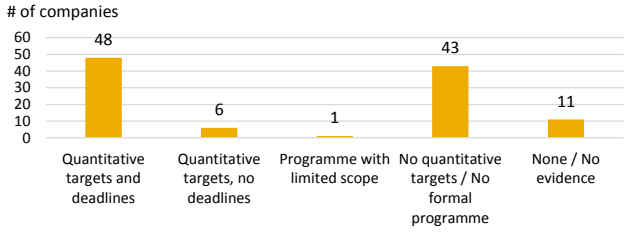
Approximately 56% of DM Utilities (62 of 110) have hazardous waste management programmes in place, although only two companies have implemented what Sustainalytics considers to be a strong programme. **Gas Natural SDG** leads the sector with its PRE3VER Project that aims to reuse, recycle or recover at least 50% of the company's hazardous waste. Against a 10% reduction target, the company annually discloses emissions volume per waste type. The second industry leader, **Electric Power Development**, reports a 98% hazardous waste re-use rate.

E.1.3.3 Air Emissions Programmes



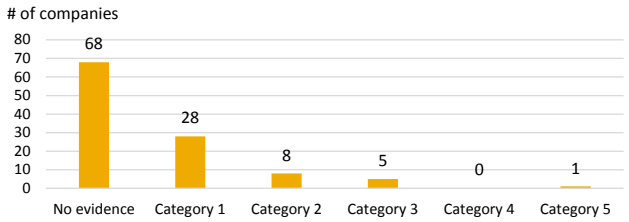
Non-GHG air emissions such as sulphur dioxide, nitrogen oxide and various atmospheric particulate matters are a major environmental issue in the sector. This concern is reflected in the fact that 68% of companies in the DM Utilities universe have an air emissions reduction programme in place, including 10% with a strong programme. **CMS Energy** sets sector best practice, publishing reduction targets for all major non-GHG pollutants through 2020. **Southern Company** has similar time-bound reduction programmes.

E.1.7 GHG Reduction Programmes



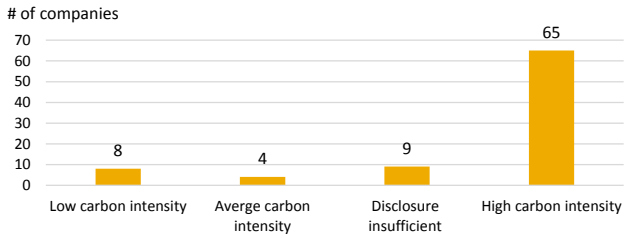
GHGs have become a material concern for electric utilities, and while exposure is strongly jurisdiction dependent, many are forging ahead with reduction programmes. Fully 44% of DM Utilities have set up strong programmes, replete with targets and deadlines. Only 11 companies were found to have no GHG reduction programmes, five of which are based in Europe.

E.1.12 Operations Incidents



Operations incidents in the Utilities sector typically involve environmental accidents, including spills, leaks and pollutant releases. Depending on the scale and geographic conditions, they can also have negative consequences for biodiversity. Encouragingly, 68 companies out of the 110 that form the DM Utilities universe have experienced no environmental operations incidents since 2011, and only one company (TEPCO) has faced a Category 5 incident (the Fukushima nuclear meltdown).

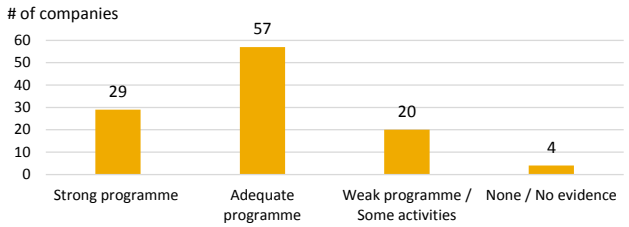
E.3.1.17 Energy Mix



Energy mix refers to the carbon intensity of electricity and heat generation by primary energy sources. As a best practice, utility companies diversify their energy sources in order to mitigate their exposure to fossil fuel price fluctuations, geopolitical concerns and operational risks. Of the 86 companies in the DM Utilities universe to which this indicator applies, a total of 65 (76%) were found to have a high-carbon energy mix, including **American Electric Power**. By contrast, **Electricité de France** and **Acciona** have low-carbon energy mixes, due to respective interests in nuclear power and renewables.

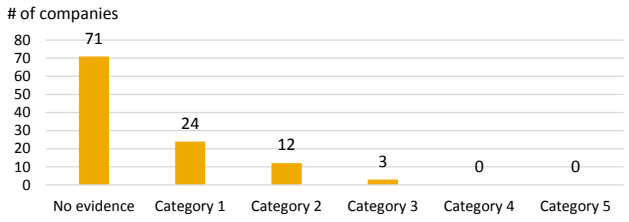
Social

S.1.6.2 Health & Safety Programmes



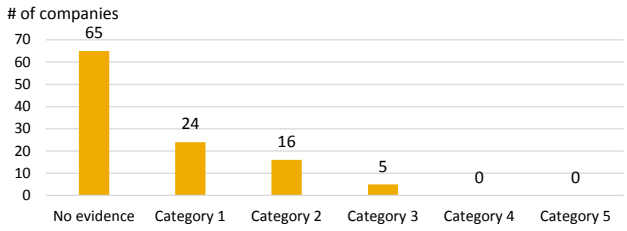
Workers in the Utilities sector are often exposed to hazardous working conditions, often working alongside high-voltage electrical conductors, high-altitude power cables, underground sewage containers and pipelines that carry inflammable substances. Programmes to proactively identify health and safety risks are considered an asset in this sector. Fully 96% of DM Utilities were found to have some form of health and safety programme in place. Best practices, exemplified by **E.ON**, **Sempra** and **TransAlta**, include board-level oversight and the use of targets to drive performance.

S.1.7 Employee Incidents



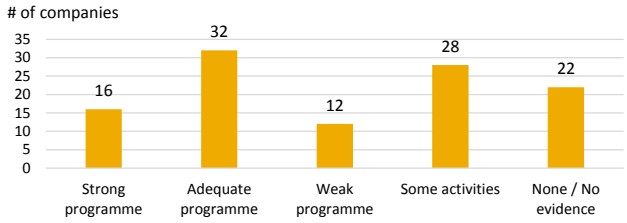
Employee and workforce-related incidents are relatively common in this sector, although severe (Category 3–5) incidents are rare. Incidents frequently centre on strikes, worker actions and demands for improved working conditions. Across the DM Utilities universe, 71 companies have experienced no employee incidents since 2011. The three most serious incidents, which received a Category 3 classification, involved **Electricité de France** (a court case related to employee health), **Entergy** (replacing striking workers) and **TEPCO** (occupational conditions during the decommissioning of Fukushima).

S.3.3 Customer Incidents



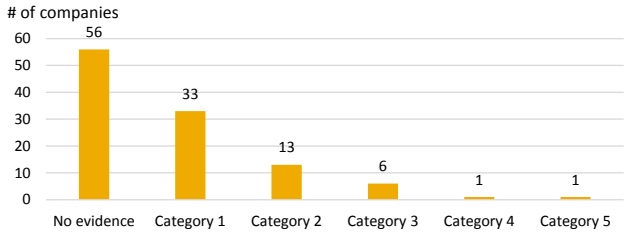
Customer incidents in the Utilities sector relate to anti-competitive practices or service blackouts that involve fines or financial penalties. In the liberalised segments of the sector, competition breaches and obstruction of investigation are also considered serious offenses. Severe incidents seem to be rare, with only five companies facing a Category 3–5 incident since 2011. **Endesa**'s decision to expose vulnerable customers to the open electricity market and **E.ON**'s competition breach are representative cases.

S.4.2.2 Community Involvement Programmes



The day-to-day operations of utility companies tend to generate high social and environmental impacts for local communities, and a growing number of industry players are recognising the benefits of sophisticated community engagement programmes. Of the 110 companies across the DM Utilities universe, 88 (or 80%) have programmes of some description in place, although only 16 firms (15%) have top-quality systems characterised by transparency, complete scope and monitoring mechanisms. Best practices are found at **Suez Environnement**, which has a permanent committee of 25 independent experts to advise on ethics, transparency and local access to water issues.

S.4.3 Society & Community Incidents



Society and community incidents primarily relate to development projects and attendant effects on local community groups. Just over half of the DM Utilities universe (56 of 110, or 51%) have avoided any society and community incidents since 2011. A single Category 5 event occurred in 2014 when **PG&E** was fined USD 1.4bn as a result of the 2010 San Bruno pipeline explosion that caused significant property damage, eight fatalities and numerous personal injuries. **Veolia Environnement's** transportation business is on a long-term contract to build and serve light-rail systems in Occupied Territories in Palestine, making the company complicit in human rights issues in a politically contested area.

Momentum

	Average score			
Indicator	**2011**	**2012**	**2013**	**current**
Environment				
E.1.3.2 Hazardous Waste Management	25	19	16	12
E.1.3.3 Air Emissions Programmes	41	37	34	19
E.1.7 GHG Reduction Programmes	58	64	63	39
E.1.12 Operations Incidents	91	93	93	96
E.3.1.17 Energy Mix	24	20	19	25
Social				
S.1.6.2 Health & Safety Programmes	57	55	57	47
S.1.7 Employee Incidents	95	97	96	98
S.3.3 Customer Incidents	92	94	94	97
S.4.2.2 Community Involvement Programmes	37	42	48	36
S.4.3 Society & Community Incidents	93	89	88	93
Governance				
n.a.	n.a.	n.a.	n.a.	n.a.

Disclosure

97 **Industry Leader**
EDP–Energias de Portugal, S.A. and Endesa SA

+47 **Momentum Leader**
The AES Corporation

-27 **Momentum Laggard**
Drax Group plc.

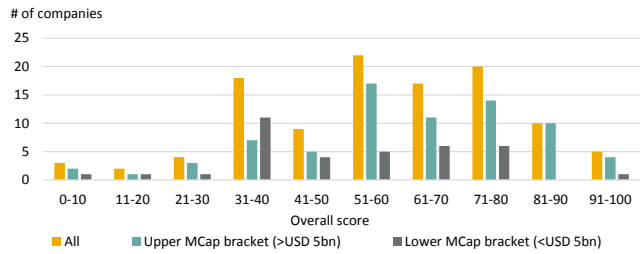
Overview

Top five companies upper MCap bracket (>USD 5bn)	Country	MCap (USD m)	Score
EDP-Energias de Portugal, S.A.	Portugal	14,136	96.8
Endesa SA	Spain	32,426	96.8
Enagas SA	Spain	6,622	92.3
Fortum OYJ	Finland	20,752	90.3
Enel SpA	Italy	45,875	89.3
Gas Natural SDG SA	Spain	25,525	89.3
Snam SpA	Italy	18,960	89.3

Top five companies lower MCap bracket (<USD 5bn)	Country	MCap (USD m)	Score
Hera S.p.A.	Italy	3,406	96.8
Statkraft AS	Norway	0	79.8
Anglian Water Services Ltd.	United Kingdom	0	77.5
Acea SpA	Italy	1,161	77.4
Vattenfall AB	Sweden	0	75.2

Disclosure refers to the scope and quality of sustainability reporting. DM Utilities are scored based on three measures of environmental reporting and five measures of governance reporting, as shown in the table below. The Disclosure performance of any given company depends on a host of factors, including management quality, the company's core market and the company's main business segment. Generally speaking, larger companies offer more robust and timely ESG disclosures than their smaller market cap peers, as smaller companies typically have fewer resources to devote to their ESG file. **EDP–Energias de Portugal** and **Endesa** were found to be the top performers on this metric within the DM Utilities universe.

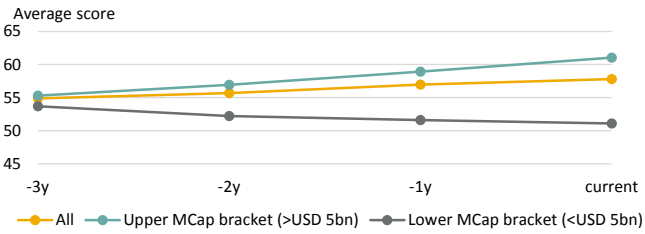
Distribution of Disclosure scores



Disclosure indicators

Disclosure	Key	Min	Avg	Med	Stdev	Max	Weight
Environment							
E.1.1.1 Environmental Reporting		0	68	100	42	100	16.1%
E.1.5 CDP Participation		0	42	25	46	100	8.1%
E.1.6 Scope of GHG Reporting		0	53	50	43	100	8.1%
Social							
n.a.		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Governance							
G.1.4 Tax Disclosure		0	63	90	42	100	30.1%
G.2.1 ESG Reporting Standards		0	39	25	38	100	15.1%
G.2.2 Verification of ESG Reporting		0	27	0	36	100	15.1%
G.2.3 Board Remuneration Disclosure		0	84	100	29	100	3.8%
G.2.4 Board Biographies Disclosure		0	87	100	33	100	3.8%

Momentum



Momentum Leaders Disclosure	Score	-1y	change
The AES Corporation	66.4	19.6	46.8
Anglian Water Services Ltd.	77.5	34.2	43.3
Enel SpA	89.3	54.3	35.0
Duke Energy Corporation	85.2	56.3	28.9
Kyushu Electric Power Co. Inc.	52.5	24.4	28.2

Momentum Laggards Disclosure	Score	-1y	change
Drax Group plc.	35.5	62.9	-27.3
MDU Resources Group Inc.	19.3	46.4	-27.1
CLP Holdings Ltd.	61.9	88.4	-26.6
TECO Energy, Inc.	46.4	69.8	-23.4
NRG Energy, Inc.	62.3	78.2	-15.9

The disclosure practices of DM Utilities have improved marginally in recent years. Notable developments have occurred with Governance indicators, including executive remuneration data, as a growing number of investors and other stakeholders are requesting this information. The average disclosure score of DM Utilities improved from 55 in 2011 to 57 in 2015, an increase of 4%. The "most improved" performer on the Disclosure measure on a trailing one-year basis was **The AES Corporation**, whose Disclosure score more than tripled from 20 in 2014 to 60 in 2015. By contrast, many companies, including **Drax Group** and **MDU Resources Group**, have seen a steep reversal in their disclosure practices. A one-year sample may not indicate a sustained trend, but any continued decline should be a warning sign for investors. Best practices in other sectors, such the GRI G4 guidelines and use of external assurance mechanisms, have made limited headway among DM Utilities.

Preparedness

79 **Industry Leader**
Enel SpA

+18 **Momentum Leader**
EDP Renovaveis

-24 **Momentum Laggard**
Power Assets Holdings Limited

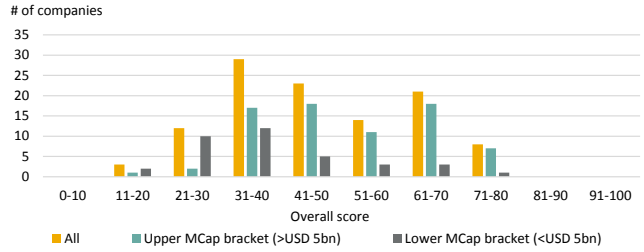
Overview

Top five companies upper MCap bracket (>USD 5bn)	Country	MCap (USD m)	Score
Enel SpA	Italy	45,875	78.9
TERNA - Rete Elettrica Nazionale Societa per Azioni	Italy	10,090	76.5
Iberdrola SA	Spain	39,542	72.1
United Utilities Group PLC	United Kingdom	8,394	72.0
Endesa SA	Spain	32,426	72.0

Top five companies lower MCap bracket (<USD 5bn)	Country	MCap (USD m)	Score
Vattenfall AB	Sweden	0	74.2
Acciona SA	Spain	3,777	67.6
Anglian Water Services Ltd.	United Kingdom	0	67.4
Hera S.p.A.	Italy	3,406	64.2
EVN AG	Austria	2,672	57.2

Preparedness indicators combine compliance and management systems, policies and programmes across the three pillars of ESG analysis. The aim is to evaluate companies' capabilities to proactively identify potential ESG challenges and opportunities and the extent of their strategic commitment to sustainability. Large Mcap companies are much better positioned on this measure relative to their smaller Mcap peers, and the differential is larger than on the Disclosure dimension. In many ways, the Disclosure and Preparedness dimensions are linked, as poor performance on the former constrains performance on the latter. The top overall Preparedness performer is **Enel SpA**, the Italian electric utility.

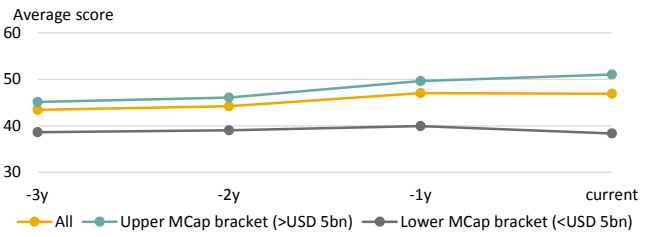
Distribution of Preparedness scores



Preparedness indicators

Preparedness	Key	Min	Avg	Med	Stdev	Max	Weight
Environment							
E.1.3.2 Hazardous Waste Management	●	0	12	0	18	100	4.4%
E.1.3.3 Air Emissions Programmes	●	0	19	25	25	100	4.4%
E.1.7 GHG Reduction Programmes	●	0	39	25	37	100	2.9%
Social							
S.1.3 Diversity Programmes		0	26	25	27	100	1.4%
S.1.6.2 Health & Safety Programmes	●	0	47	50	29	100	2.7%
S.2.1 Scope of Social Supplier Standards		0	32	25	32	100	2.7%
S.1.3 Diversity Programmes		0	26	25	27	100	1.4%
S.4.2.2 Community Involvement Programmes	●	0	36	25	34	100	2.7%
S.4.2.10 Access to Basic Services		0	45	40	41	100	2.7%
Governance							
G.1.3 Global Compact Signatory		0	25	0	43	100	2.7%
G.2.9 Board Independence		0	44	25	45	100	2.7%
G.2.11 Non-Audit to Audit Fee Ratio		0	86	100	31	100	0.7%

Momentum



Momentum Leaders Preparedness	Score	-1y	change
EDP Renovaveis	49.9	31.9	18.0
Enel Green Power S.p.A.	65.9	48.1	17.9
Vattenfall AB	74.2	59.3	14.9
EWE AG	24.1	9.2	14.8
The AES Corporation	43.0	29.8	13.1

Momentum Laggards Preparedness	Score	-1y	change
Power Assets Holdings Limited	41.1	64.9	-23.8
TransAlta Corp.	39.1	56.8	-17.7
Southern Company	37.6	47.2	-9.7
NRG Energy, Inc.	38.7	48.2	-9.5
APA Group	30.0	36.6	-6.6

The performance of the DM Utilities universe as a whole is up in recent years, with a mean score of 47 in 2014 compared to 44 in 2011. But virtually all of these gains have occurred at large Mcap companies. Indeed, the mean Preparedness score of companies in the lower Mcap subset remained completely flat from 2011–2014. This analysis underscores how the resource advantage of large Mcap companies can translate into superior ESG scores, although as we stress throughout this report, larger firms typically face greater *exposure* to ESG risks in the first place. **EDP Renovavels** was the momentum leader, with a current score of 50 up from 32 a year ago. Italy's **Enel Green Power S.p.A** and the **Swedish Vattenfall AB** also enjoyed healthy improvements. Momentum laggards include **Power Assets Holdings**, **TransAlta, Southern Company, NRG Energy** and **APA Group**. Much of the performance drop for these companies is a result of Disclosure, as these firms have not kept pace in recent years with improving sustainability disclosure practices across the sector.

Quantitative Performance

91 **Industry Leader**
Acciona SA

+20 **Momentum Leader**
Fortum OYJ

-27 **Momentum Laggard**
Entergy Corporation

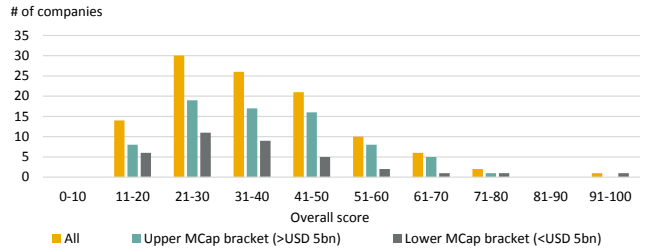
Overview

Top five companies upper MCap bracket (>USD 5bn)	Country	MCap (USD m)	Score
Veolia Environnement S.A.	France	8,821	72.0
Electricite de France SA	France	65,881	68.2
Verbund AG	Austria	7,780	67.4
Exelon Corporation	United States	24,798	63.5
EDP Renovaveis	Spain	5,227	61.8

Top five companies lower MCap bracket (<USD 5bn)	Country	MCap (USD m)	Score
Acciona SA	Spain	3,777	90.9
Statkraft AS	Norway	0	77.0
Hera S.p.A.	Italy	3,406	64.4
Acea SpA	Italy	1,161	55.7
Eandis cvba	Belgium	0	54.2

Quantitative Performance indicators are designed to move past Disclosure and Preparedness to assess a company's quantitative Environmental and Social sustainability performance using core industry measures, including carbon footprint, energy mix and occupational health and safety. As a high-impact sector, the Utilities sector has a lower mean score on this metric than most other sectors. Large companies do not enjoy particularly favourable performance on this dimension. Indeed, the top overall performer, **Acciona**, sits in the lower market cap subset of the industry.

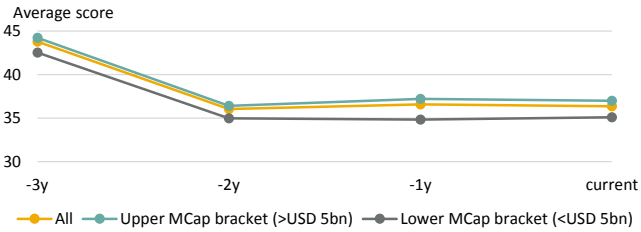
Distribution of Quantitative Performance scores



Quantitative Performance indicators

Quantitative Performance	Key	Min	Avg	Med	Stdev	Max	Weight
Environment							
E.1.2.7 Water Intensity		0	38	0	45	100	12.3%
E.1.4 Environmental Fines & Penalties		0	80	100	31	100	6.2%
E.1.9 Carbon Intensity		0	42	25	42	100	6.2%
E.1.10 Carbon Intensity Trend		0	24	0	32	100	6.2%
E.1.11 Renewable Energy Use		0	18	0	38	100	3.1%
E.3.1.1 Sustainable Products & Services		0	35	25	35	100	11.5%
E.3.1.17 Energy Mix	●	0	25	0	37	100	28.7%
Social							
S.1.4 Collective Bargaining Agreements		0	53	50	35	100	2.9%
S.1.5 Employee Turnover Rate		0	27	0	37	100	2.9%
S.1.6 Top Employer Recognition		0	15	0	32	100	2.9%
S.1.6.5 LTIR Trend		0	62	100	44	100	2.9%
S.1.6.6 Employee Fatalities		0	64	50	27	100	2.9%
S.4.1 Activities in Sensitive Countries		0	97	100	15	100	2.9%
S.5.3 Cash Donations		0	36	25	31	100	8.6%
Governance							
n.a.		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Momentum



The Quantitative Performance of the Utilities sector as a whole is trending downward, reflecting diminished performance on a variety of core Environmental indicators, including carbon intensity and water intensity. The trend has essentially been felt equally by large as well as small market cap companies. The mean score of the DM Utilities universe declined from 44 in 2012 to 36 in 2013, a decrease of 18%. The following two years, the score remained stable at a level fo36 points, indicating low willingness to work on improving measurable ESG performance.

Looking at individual securities, we see that Finnish **Fortum** was the momentum leader. **Entergy Corporation** had the largest year-on-year decline, with its score dropping from 57 in 2014 to 30 in 2015. This was largely a result of a collapse in the company's Energy Mix score.

Momentum Leaders Quantitative Performance	Score	-1y	change
Fortum OYJ	45.1	24.9	20.2
Suez Environnement Company SA	48.5	30.8	17.7
Consolidated Edison Inc.	55.5	38.7	16.9
Iberdrola SA	44.1	29.8	14.3
United Utilities Group PLC	47.2	33.7	13.6

Momentum Laggards Quantitative Performance	Score	-1y	change
Entergy Corporation	30.2	57.0	-26.8
Endesa SA	39.1	58.1	-19.0
American Water Works Company, Inc.	34.8	49.6	-14.8
ATCO Ltd.	25.2	39.7	-14.6
NRG Energy, Inc.	18.2	31.4	-13.2

Qualitative Performance

42 **Industry Laggard**
Tokyo Electric Power Co. Inc.

+12 **Momentum Leader**
NRG Energy, Inc.

-7 **Momentum Laggard**
American Electric Power Co., Inc.

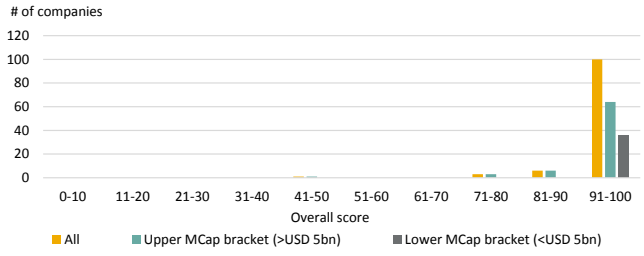
Overview

Bottom five companies upper MCap bracket	Country	MCap (USD m)	Score
Tokyo Electric Power Co. Inc.	Japan	7,329	41.8
GDF Suez SA	France	54,681	76.0
Enel SpA	Italy	45,875	78.8
Endesa SA	Spain	32,426	79.0
PG & E Corp.	United States	19,387	83.1

Bottom five companies lower MCap bracket	Country	MCap (USD m)	Score
Electric Power Development Co. Ltd.	Japan	4,456	93.5
AusNet Services	Australia	3,836	94.6
Statkraft AS	Norway	0	95.6
Vattenfall AB	Sweden	0	97.1
Shikoku Electric Power Co. Inc.	Japan	2,964	97.6

Qualitative Performance assesses the extent to which utilities have been involved in Environment incidents and, less importantly, Social and Governance incidents. Prominent Environmental incidents include pipeline explosions, toxic releases and controversies related to dam construction. Large companies are more exposed to severe controversies than their smaller Mcap peers. Geographically, DM markets behave similarly, and there is no evidence that companies in a given country are consistently more likely to be involved in ESG incidents. **TEPCO** has the poorest sector-wide Quantitative Performance as a result of continued clean up of the 2011 Fukushima nuclear accident.

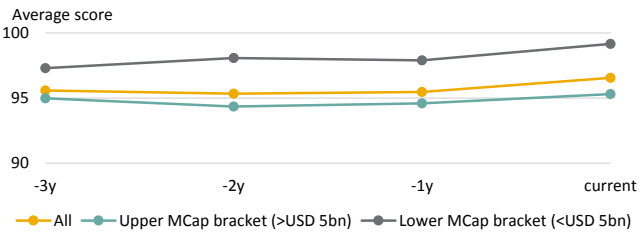
Distribution of Qualitative Performance scores



Qualitative Performance indicators

Qualitative Performance	Key	Min	Avg	Med	Stdev	Max	Weight
Environment							
E.1.12 Operations Incidents	●	0	96	100	12	100	27.1%
E.2.2 Environmental Supply Chain Incidents		99	100	100	0	100	5.1%
E.3.2 Product & Service Incidents		100	100	100	0	100	7.6%
Social							
S.1.7 Employee Incidents	●	50	98	100	8	100	10.1%
S.2.3 Social Supply Chain Incidents		50	100	100	3	100	3.8%
S.3.3 Customer Incidents	●	50	97	100	9	100	10.1%
S.4.3 Society & Community Incidents	●	0	93	100	18	100	11.4%
Governance							
G.1.5 Business Ethics Incidents		0	98	100	10	100	10.1%
G.2.13 Governance Incidents		20	99	100	5	100	10.8%
G.3.4 Public Policy Incidents		80	100	100	3	100	3.8%

Momentum



Momentum Leaders Qualitative Performance	Score	-1y	change
NRG Energy, Inc.	94.2	82.0	12.2
Acciona SA	99.7	90.3	9.5
Entergy Corporation	92.0	83.5	8.6
Tohoku Electric Power Co. Inc.	99.7	92.2	7.6
The AES Corporation	99.8	92.3	7.5

Momentum Laggards Qualitative Performance	Score	-1y	change
American Electric Power Co., Inc.	90.5	97.5	-7.1
GDF Suez SA	76.0	82.1	-6.2
Endesa SA	79.0	85.2	-6.2
Fortis Inc.	92.4	97.6	-5.2
Enel SpA	78.8	83.7	-4.9

The Quantitative Performance of the DM Utilities universe has trended upward in recent years, which could indicate growing awareness across the sector about the importance of closely managing environmental incidents, employee issues and business ethics concerns. On this particular dimension, smaller companies enjoy favourable positioning relative to their larger Mcap peers, as documented in the time series graph to the left. These findings corroborate the longstanding view that large companies typically face greater exposure to ESG risks.

The momentum leader on this measure, **NRG Energy**, improved its score from 82 in 2014 to 94 in 2015. Momentum laggards **Enel** and **Endesa** (part of Enel Group) are European peers that are involved in the construction of controversial hydro dams in southern Chile. Canada's **Fortis Inc.** has been involved in the discharge and release of contaminated water in Belize.

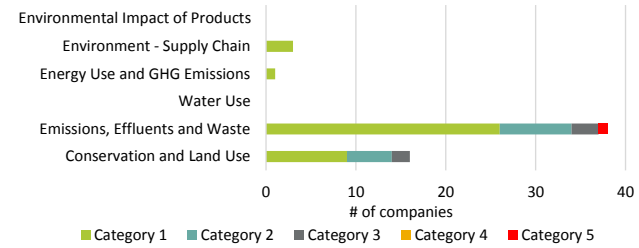
Events related to Environmental issues

5 **Highest Category**
Tokyo Electric Power Co. Inc.

2 **Average Impact Score**

3 **Average Risk Score**

Evaluation of events per indicator



Environmental incidents in the Utilities sector typically involve discharges of emissions, effluents and waste or generalised environmental contamination that affects conservation and land use. A total of 58 environmental events have occurred in the sector since 2012, with 37 (66%) related to Emissions, Effluents and Waste. **TEPCO** is the only company in the DM Utilities universe currently exposed to a severe (Category 5) event as a result of its involvement in the 2012 Fukushima nuclear disaster.

Events related to Social issues

5 **Highest Category**
Tokyo Electric Power Co. Inc.

3 **Average Impact Score**

3 **Average Risk Score**

Evaluation of events per indicator

Social controversies are relatively common in the Utilities sector. A total of 182 events covering the full gamut of Social indicators have been recorded since 2012. The vast majority (98 or 54%) are relatively inconsequential Category 1 events. Events are typically centred around the displacement of local communities in infrastructure development, anti-competitive practices, violations of health and safety regulations, product quality and safety and labour conflicts. A single Category 5 event has been recorded since 2012, and once again it relates to the **TEPCO**'s nuclear power plant failure.

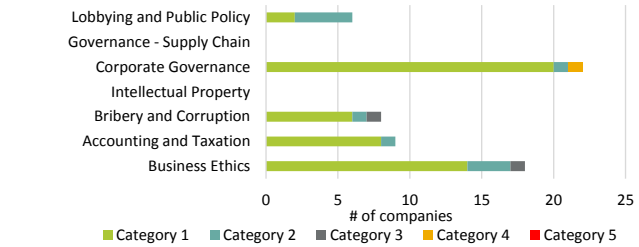
Events related to Governance issues

4 **Highest Category**
Tokyo Electric Power Co. Inc.

2 **Average Impact Score**

2 **Average Risk Score**

Evaluation of events per indicator



Governance-related events in the Utilities sector typically include violations for business ethics or corporate governance practices, including political lobbying and bribery and corruption issues. A total of 63 incidents have been recorded since 2012. **TEPCO**'s governance shortcomings in the wake of the Fukushima disaster rank as the most severe Governance incident in the sector (Category 4).

List of Companies Covered

Company Name	Sub-Industry	Country	FF MCap. (m USD)	ISIN Code	Sustainalytics' ESG Score				
					Overall	YOY	Env.	Social	Gov.
2i Rete Gas S.p.A.	Gas Utilities	Italy	n.a.	SUST3719CF58	52.0	n.a.	44.9	57.5	58.0
A2A SpA	Multi-Utilities	Italy	3,520	IT0001233417	72.6	4.9%	69.8	71.4	78.9
Aboitiz Power Corp.	Independent Power Produce	Philippines	5,955	PHY0005M1090	51.8	1.6%	42.2	52.3	68.3
Acciona SA	Electric Utilities	Spain	3,777	ES0125220311	84.1	6.2%	88.7	85.3	74.3
Acea SpA	Multi-Utilities	Italy	1,161	IT0001207098	69.2	n.a.	63.0	73.6	75.2
Adani Power Ltd.	Independent Power Produce	India	1,529	INE814H01011	48.0	n.a.	37.8	55.3	57.6
AES Gener S.A.	Independent Power Produce	Chile	4,099	CL0001880955	58.3	6.1%	48.7	67.4	64.8
AES Tiete S.A.	Renewable Electricity	Brazil	2,638	BRGETIACNOR7	75.8	11.6%	72.9	74.8	82.3
AGL Energy Limited	Multi-Utilities	Australia	7,847	AU000000AGK9	69.1	-1.7%	58.7	71.6	84.9
AGL Resources Inc.	Gas Utilities	United States	5,406	US0012041069	57.3	-2.2%	47.6	61.2	69.9
Aguas Andinas S.A.	Water Utilities	Chile	3,804	CL0000000035	61.0	-2.0%	50.9	61.2	79.0
Algonquin Power & Utilities Corp.	Independent Power Produce	Canada	1,388	CA0158571053	54.2	0.5%	47.2	52.8	68.7
Alliander N.V.	Multi-Utilities	Netherlands	n.a.	SUST61DD75E0	57.9	0.1%	47.7	65.4	67.0
Alliant Energy Corporation	Multi-Utilities	United States	5,840	US0188021085	61.9	0.6%	52.2	67.3	72.9
Ameren Corporation	Multi-Utilities	United States	9,229	US0236081024	61.0	4.5%	47.2	67.1	78.4
American Electric Power Co., Inc.	Electric Utilities	United States	23,867	US0255371017	61.7	-8.1%	46.3	68.4	81.4
American Water Works Company, Inc.	Water Utilities	United States	7,647	US0304201033	72.0	-0.1%	64.4	73.4	84.0
Anglian Water Services Ltd.	Water Utilities	United Kingdom	n.a.	SUSTAFA98C66	76.4	12.9%	74.5	80.5	74.9
APA Group	Gas Utilities	Australia	4,655	AU000000APA1	62.5	-5.3%	55.1	63.1	74.9
Aqua America Inc.	Water Utilities	United States	4,276	US03836W1036	57.7	-0.1%	46.3	59.4	76.0
ATCO Ltd.	Multi-Utilities	Canada	5,287	CA0467894006	57.9	-4.6%	50.2	66.7	61.2
Atlantic Power Corporation	Independent Power Produce	United States	279	CA04878Q8636	50.9	3.7%	40.0	50.6	70.8
Atmos Energy Corporation	Gas Utilities	United States	4,461	US0495601058	54.5	1.1%	41.1	61.5	70.0
AusNet Services	Electric Utilities	Australia	3,836	AU000000AST5	59.3	-3.2%	52.4	57.2	74.2
Australian Gas Networks Limited	Gas Utilities	Australia	1,905	SUST47DBD0E6	62.0	1.8%	57.6	65.2	66.0
Beijing Enterprises Water Group Limited	Water Utilities	Hong Kong	4,959	BMG0957L1090	46.4	-0.7%	40.0	49.8	54.0
Beijing Jingneng Clean Energy Corp.	Independent Power Produce	China	2,690	CNE100001336	46.6	n.a.	38.9	51.8	54.0
Brookfield Renewable Energy Partners LP	Renewable Electricity	Bermuda	7,481	BMG162581083	65.8	n.a.	61.1	61.2	79.8
Calpine Corp.	Independent Power Produce	United States	8,534	US1313473043	58.7	4.7%	46.3	66.6	71.6
Canadian Utilities Ltd.	Multi-Utilities	Canada	9,127	CA1367178326	58.4	2.6%	45.2	61.7	78.0
Capital Power Corporation	Independent Power Produce	Canada	1,732	CA14042M1023	66.9	16.5%	51.6	70.8	90.0
CenterPoint Energy, Inc.	Multi-Utilities	United States	9,987	US15189T1079	60.5	3.8%	50.6	63.6	74.4
Centrais Elétricas Brasileiras S.A. – Eletrobras	Electric Utilities	Brazil	5,299	BRELETACNPB7	67.6	2.7%	61.1	68.5	78.3
Centrica plc	Multi-Utilities	United Kingdom	27,109	GB00B033F229	78.0	0.7%	71.2	80.5	87.1
CEZ, a.s.	Electric Utilities	Czech Republic	13,867	CZ0005112300	55.3	-0.7%	51.3	59.9	56.9
Cheung Kong Infrastructure Holdings Ltd.	Electric Utilities	Hong Kong	14,563	BMG2098R1025	49.2	-1.6%	42.9	53.9	54.8
China Gas Holdings Ltd.	Gas Utilities	Hong Kong	7,324	BMG2109G1033	49.8	-0.7%	44.2	54.8	54.0
China Longyuan Power Group Corporation Limited	Renewable Electricity	China	9,999	CNE100000HD4	51.6	-7.9%	47.6	51.8	58.8
China Resources Gas Group Limited	Gas Utilities	Hong Kong	7,168	BMG2113B1081	47.1	-0.7%	40.0	51.8	54.0
China Resources Power Holdings Co. Ltd.	Independent Power Produce	Hong Kong	11,713	HK0836012952	43.4	-0.1%	39.6	47.1	46.0
Chubu Electric Power Co. Inc.	Electric Utilities	Japan	8,903	JP3526600006	61.9	1.8%	60.2	60.0	67.5
Chugoku Electric Power Co. Inc.	Electric Utilities	Japan	4,810	JP3522200009	60.6	6.4%	62.7	61.6	55.7
CLP Holdings Ltd.	Electric Utilities	Hong Kong	19,365	HK0002007356	70.4	-3.3%	63.8	72.6	79.8
CMS Energy Corp.	Multi-Utilities	United States	7,460	US1258961002	76.1	9.4%	67.2	83.2	83.7
Colbun S.A.	Independent Power Produce	Chile	4,002	CLP3615W1037	60.9	0.0%	62.0	66.9	51.8
Companhia de Gas de Sao Paulo	Gas Utilities	Brazil	2,390	BRCGASACNPA3	62.6	-0.9%	57.1	61.0	74.5
Companhia de Saneamento Basico	Water Utilities	Brazil	6,595	BRSBSPACNOR5	61.4	8.3%	48.7	66.5	78.3
Companhia De Saneamento De Minas Gerais.	Water Utilities	Brazil	1,584	BRCSMGACNOR5	66.7	13.5%	58.9	71.5	75.0
Companhia De Transmissao De Energia Eletrica Paulista	Electric Utilities	Brazil	2,081	BRTRPLACNPR1	60.0	6.3%	50.7	55.6	82.3
Companhia Energética de Minas Gerais S.A.	Electric Utilities	Brazil	7,201	BRCMIGACNPR3	74.8	-1.0%	68.8	76.7	83.2
Companhia Energetica de Sao Paulo SA	Renewable Electricity	Brazil	3,132	BRCESPACNPB4	63.7	-2.4%	60.4	66.6	66.3
Companhia Paranaense de Energia	Electric Utilities	Brazil	2,522	BRCPLEACNPB9	74.0	-5.9%	61.8	75.8	93.8
Consolidated Edison Inc.	Multi-Utilities	United States	15,818	US2091151041	69.6	3.3%	69.6	68.5	71.1
Contact Energy Ltd.	Electric Utilities	New Zealand	3,164	NZCENE0001S6	57.1	-5.9%	45.1	66.2	67.9
CPFL Energia S.A.	Electric Utilities	Brazil	7,068	BRCPFEACNOR0	75.9	7.3%	71.8	78.0	81.0
CT Environmental Group Limited	Water Utilities	China	1,211	KYG258851073	48.1	n.a.	43.8	49.8	54.0
Datang International Power Generation Co. Ltd.	Independent Power Produce	China	7,882	CNE1000002Z3	49.3	0.0%	39.8	55.7	58.8
Dominion Resources, Inc.	Multi-Utilities	United States	40,259	US25746U1097	65.0	-0.5%	51.8	75.3	76.3
Drax Group plc.	Independent Power Produce	United Kingdom	5,306	GB00B1VNSX38	62.7	-8.4%	61.4	59.8	68.3
DTE Energy Co.	Multi-Utilities	United States	12,181	US2333311072	67.6	4.4%	52.6	81.0	78.4
DUET Group	Multi-Utilities	Australia	2,438	AU000000DUE7	59.6	-0.1%	53.1	56.0	75.8
Duke Energy Corporation	Electric Utilities	United States	50,033	US26441C2044	63.2	2.3%	39.9	77.5	87.9
Dynegy Inc.	Independent Power Produce	United States	2,056	US26817R1086	51.1	2.8%	40.7	53.9	66.5
E.ON SE	Multi-Utilities	Germany	35,570	DE000ENAG999	67.3	0.6%	62.4	71.9	70.6
Eandis cvba	Electric Utilities	Belgium	n.a.	SUST3A697888	61.5	n.a.	53.6	71.2	64.3
Edelnor S.A.	Electric Utilities	Chile	1,400	CLP371091081	60.6	0.0%	52.2	69.4	65.0
Edison International	Electric Utilities	United States	16,169	US2810201077	59.7	-0.8%	49.3	64.0	73.4
Edison SpA	Independent Power Produce	Italy	155	IT0003372205	67.4	-4.1%	49.6	81.1	83.0
EDP - Energias do Brasil S.A.	Electric Utilities	Brazil	1,934	BRENBRACNOR2	73.1	20.2%	61.6	79.9	85.8
EDP Renovaveis	Renewable Electricity	Spain	5,227	ES0127797019	72.1	10.4%	67.3	75.0	77.3
EDP-Energias de Portugal, S.A.	Electric Utilities	Portugal	14,136	PTEDP0AM0009	79.2	7.7%	66.6	88.1	91.2
El Paso Electric Co.	Electric Utilities	United States	1,421	US2836778546	54.2	0.0%	39.8	58.5	75.0

List of Companies Covered (cont.)

Company Name	Sub-Industry	Country	FF MCap. (m USD)	ISIN Code	Sustainalytics' ESG Score				
					Overall	YOY	Env.	Social	Gov.
Electric Power Development Co. Ltd.	Independent Power Produce	Japan	4,456	JP3551200003	67.2	8.7%	72.3	56.5	70.7
Electricite de France SA	Electric Utilities	France	65,881	FR0010242511	75.7	-1.0%	75.3	78.0	73.6
Electricity Generating Public Co. Ltd.	Independent Power Produce	Thailand	2,030	TH0465010005	60.4	18.6%	52.7	62.3	72.3
Elenia Finance Oyj	Electric Utilities	Finland	n.a.	SUSTE587C9D2	55.9	n.a.	53.0	58.3	58.2
ELETROPAULO-Metropolitana	Electric Utilities	Brazil	603	BRELPLACNPR6	77.8	1.4%	75.8	75.5	84.1
Elia System Operator SA	Electric Utilities	Belgium	2,827	BE0003822393	61.5	8.8%	58.4	67.8	59.5
Emera Inc.	Electric Utilities	Canada	4,178	CA2908761018	60.8	4.2%	54.0	60.3	73.6
Empresa de Energia de Bogota S.A. ESP	Gas Utilities	Colombia	6,436	COE01PA00026	64.8	n.a.	49.8	74.5	80.3
Empresa Nacional de Electricidad SA Chile	Independent Power Produce	Chile	11,250	CLP3710M1090	70.2	-5.0%	49.0	84.0	91.8
Empresas Publicas de Medellin E.S.P.	Multi-Utilities	Colombia	n.a.	SUST9250F829	70.0	n.a.	64.4	69.8	80.3
Enagas SA	Gas Utilities	Spain	6,622	ES0130960018	79.2	-3.2%	76.6	75.5	88.3
EnBW Energie Baden-Wuerttemberg AG	Electric Utilities	Germany	10,015	DE0005220008	70.3	-0.4%	65.3	74.5	74.1
Endesa SA	Electric Utilities	Spain	32,426	ES0130670112	70.8	-5.6%	59.7	78.4	81.7
ENEA S.A.	Electric Utilities	Poland	2,012	PLENEA000013	55.3	10.8%	48.7	57.3	64.8
Enel Green Power S.p.A.	Renewable Electricity	Italy	13,440	IT0004618465	75.2	13.7%	75.6	81.1	67.3
Enel SpA	Electric Utilities	Italy	45,875	IT0003128367	74.5	7.3%	66.0	74.1	90.3
ENERGA Spolka Akcyjna	Electric Utilities	Poland	2,840	PLENERG00022	60.0	n.a.	47.8	61.8	80.0
Energy Development Corporation	Renewable Electricity	Philippines	2,249	PHY2292T1026	60.2	-2.2%	55.7	65.6	62.0
Energy World Corp. Ltd.	Independent Power Produce	Australia	563	AU000000EWC5	44.2	0.0%	35.6	54.0	47.8
Enersis S.A.	Electric Utilities	Chile	14,223	CLP371861061	67.6	2.4%	47.3	87.3	80.6
Eneva S.A.	Independent Power Produce	Brazil	763	BRENEVACNOR8	47.7	-6.1%	38.7	55.1	55.0
Enexis Holding N.V.	Electric Utilities	Netherlands	n.a.	SUSTC0AD5F7B	66.6	0.0%	56.7	67.1	84.0
ENN Energy Holdings Limited	Gas Utilities	China	7,064	KYG3066L1014	48.1	0.1%	42.2	51.8	54.0
Entergy Corporation	Electric Utilities	United States	11,339	US29364G1031	66.5	-1.5%	56.6	72.5	77.1
Ervia	Gas Utilities	Ireland	n.a.	SUST2939DB80	56.5	-0.6%	42.0	61.3	77.0
ESB Finance Limited	Electric Utilities	Ireland	n.a.	SUSTE3BF6D17	63.8	n.a.	55.8	71.1	69.5
Etrion Corporation	Renewable Electricity	Switzerland	190	CA29786T1057	52.8	n.a.	50.0	50.4	60.8
Eversource Energy	Electric Utilities	United States	13,987	US6643971061	67.6	-0.9%	59.5	75.2	73.0
EVN AG	Electric Utilities	Austria	2,672	AT0000741053	71.3	-1.0%	65.2	76.8	75.7
EWE AG	Electric Utilities	Germany	n.a.	SUST8F1C6660	49.7	11.6%	40.6	63.8	49.0
Exelon Corporation	Electric Utilities	United States	24,798	US30161N1019	75.9	0.3%	74.1	78.8	75.7
Federal Grid Company of Unified Energy System	Electric Utilities	Russia	3,020	RU000A0JPNN9	54.3	-5.3%	49.6	55.6	61.3
FirstEnergy Corp.	Electric Utilities	United States	12,994	US3379321074	55.3	7.2%	46.2	53.4	74.0
Fortis Inc.	Electric Utilities	Canada	5,957	CA3495531079	52.3	-4.7%	44.3	54.3	64.2
Fortum OYJ	Electric Utilities	Finland	20,752	FI0009007132	76.0	3.1%	70.6	74.1	88.1
Gail India Ltd.	Gas Utilities	India	7,200	INE129A01019	60.6	27.9%	66.0	44.8	70.0
Gas Natural SDG SA	Gas Utilities	Spain	25,525	ES0116870314	75.5	0.7%	79.1	76.7	67.8
GDF Suez SA	Multi-Utilities	France	54,681	FR0010208488	64.2	2.8%	53.4	78.2	66.8
Glow Energy Public Co., Ltd.	Independent Power Produce	Thailand	3,113	TH0834010009	55.1	-1.2%	51.2	53.4	64.0
Great Plains Energy Incorporated	Electric Utilities	United States	3,835	US3911641005	53.5	-2.4%	40.2	63.0	66.0
Guangdong Electric Power Development Co. Ltd.	Independent Power Produce	China	3,274	CNE000000HW5	52.5	0.0%	56.4	48.3	50.4
Guangdong Investment Ltd.	Water Utilities	Hong Kong	6,267	HK0270001396	43.4	0.0%	33.3	49.8	54.0
Hawaiian Electric Industries Inc.	Electric Utilities	United States	2,597	US4198701009	54.5	-11.2%	37.8	58.4	79.8
Hera S.p.A.	Multi-Utilities	Italy	3,406	IT0001250932	80.6	6.2%	74.1	81.3	91.2
Hokkaido Electric Power Co. Inc.	Electric Utilities	Japan	2,012	JP3850200001	59.8	-4.8%	59.3	58.6	62.1
Hokuriku Electric Power Co.	Electric Utilities	Japan	2,631	JP3845400005	67.6	0.6%	67.7	67.1	68.1
Hong Kong And China Gas Co., Ltd.	Gas Utilities	Hong Kong	19,647	HK0003000038	61.8	-1.9%	56.8	72.1	58.6
Huadian Energy Company Limited	Independent Power Produce	China	756	CNE000000K58	45.4	0.0%	37.8	49.8	54.0
Huadian Fuxin Energy Corporation Limited	Independent Power Produce	China	3,736	CNE100001F60	45.7	n.a.	43.3	49.8	45.0
Huadian Power International Corporation Limited	Independent Power Produce	China	3,525	CNE1000003D8	52.0	0.0%	42.0	53.9	67.8
Huaneng Power International Inc.	Independent Power Produce	China	11,696	CNE1000006Z4	46.3	-11.0%	41.1	51.8	49.0
Huaneng Renewables Corporation Limited	Renewable Electricity	China	2,604	CNE100000WS1	53.0	n.a.	50.9	51.8	58.0
Hydro One Inc.	Electric Utilities	Canada	n.a.	SUST593288AB	61.6	n.a.	49.1	69.1	75.0
Hydro-Quebec	Renewable Electricity	Canada	n.a.	SUST275309D6	78.3	-0.6%	75.6	79.9	81.3
Iberdrola SA	Electric Utilities	Spain	39,542	ES0144580Y14	74.4	5.1%	70.5	79.3	75.6
Infinis Energy plc	Renewable Electricity	United Kingdom	1,108	GB00BFG1QM56	67.4	n.a.	64.2	68.6	71.5
Infraestructura Energetica Nova, S.A.B. de C.V.	Gas Utilities	Mexico	6,436	MX01IE060002	60.3	n.a.	56.4	60.2	67.3
Innergex Renewable Energy Inc.	Renewable Electricity	Canada	891	CA45790B1040	57.6	n.a.	50.0	54.5	75.0
Integrys Energy Group, Inc.	Multi-Utilities	United States	4,325	US45822P1057	58.2	6.4%	44.5	63.3	76.8
Interconexion Electrica SAESP	Electric Utilities	Colombia	4,100	COE15PA00026	62.8	-8.1%	50.2	67.2	80.3
Isagen S.a. E.s.p.	Electric Utilities	Colombia	3,688	COE16PA00016	71.6	0.6%	60.0	77.3	85.8
ITC Holdings Corp.	Electric Utilities	United States	5,309	US4656851056	54.1	-0.8%	46.7	53.3	68.6
Joint Stock Company E.ON Russia	Independent Power Produce	Russia	4,200	RU000A0JNGA5	54.9	10.3%	41.2	66.9	65.0
JSC ROSSETI	Electric Utilities	Russia	3,345	RU000A0JPVJ0	50.0	-4.3%	43.6	56.4	54.0
JSC TGC-1	Electric Utilities	Russia	722	RU000A0JNUD0	53.4	6.8%	55.6	49.8	54.0
JSW Energy Ltd.	Independent Power Produce	India	1,164	INE121E01018	44.1	0.0%	36.7	49.8	50.6
Just Energy Group Inc.	Multi-Utilities	Canada	970	CA48213W1014	46.8	-3.1%	42.2	44.8	57.6
Kansai Electric Power Co. Inc.	Electric Utilities	Japan	9,481	JP3228600007	60.0	1.4%	60.9	59.0	59.7
Korea Electric Power Corp.	Electric Utilities	South Korea	21,107	KR7015760002	59.3	7.6%	63.0	63.6	47.4
Korea Gas Corp.	Gas Utilities	South Korea	5,311	KR7036460004	53.6	11.0%	42.7	47.7	80.5
Kyushu Electric Power Co. Inc.	Electric Utilities	Japan	5,622	JP3246400000	61.8	6.5%	64.9	60.4	57.9
Light SA	Electric Utilities	Brazil	1,521	BRLIGTACNOR2	74.6	-8.6%	70.7	71.8	85.0

List of Companies Covered (cont.)

Company Name	Sub-Industry	Country	FF MCap. (m USD)	ISIN Code	Sustainalytics' ESG Score				
					Overall	YOY	Env.	Social	Gov.
Madrilena Red de Gas Finance B.V.	Gas Utilities	Netherlands	n.a.	SUSTD5BD1626	52.0	n.a.	52.6	55.0	47.6
Manila Electric Co.	Electric Utilities	Philippines	6,417	PHY5764J1483	45.6	4.0%	37.3	50.1	55.0
Manila Water Co Inc.	Water Utilities	Philippines	1,274	PHY569991086	60.3	9.8%	50.2	64.7	73.0
MDU Resources Group Inc.	Multi-Utilities	United States	6,265	US5526901096	57.8	-3.0%	48.3	66.0	65.2
Mosenergo AO	Electric Utilities	Russia	996	RU0008958863	54.4	0.5%	50.6	53.8	62.0
N.V. Nederlandse Gasunie	Gas Utilities	Netherlands	n.a.	SUSTCCBBB812	66.9	4.8%	66.1	58.5	78.4
National Fuel Gas Co.	Gas Utilities	United States	6,257	US6361801011	51.4	0.0%	40.7	57.1	64.0
National Grid plc	Multi-Utilities	United Kingdom	50,073	GB00B08SNH34	71.0	-2.0%	65.4	79.4	71.0
NextEra Energy, Inc.	Electric Utilities	United States	40,123	US65339F1012	63.8	9.3%	50.6	74.2	75.1
NHPC Ltd.	Renewable Electricity	India	3,629	INE848E01016	46.8	-3.7%	48.0	40.7	51.8
Nisource Inc.	Multi-Utilities	United States	10,855	US65473P1057	68.3	8.3%	55.6	70.9	88.0
Northland Power Inc.	Independent Power Produce	Canada	1,932	CA6665111002	51.8	-13.7%	40.2	49.8	75.0
NRG Energy, Inc.	Independent Power Produce	United States	8,887	US6293775085	58.7	-3.2%	45.7	65.2	74.2
NTPC Ltd.	Independent Power Produce	India	17,350	INE733E01010	53.9	5.2%	44.2	62.1	61.6
OGE Energy Corp.	Electric Utilities	United States	6,920	US6708371033	60.7	1.5%	47.8	68.1	75.0
ONE Gas, Inc.	Gas Utilities	United States	1,879	US68235P1084	57.5	n.a.	43.3	58.5	81.8
Open Joint-Stock Company INTER RAO UES	Electric Utilities	Russia	2,929	RU000A0JPNM1	50.1	0.0%	42.2	55.5	58.0
Open Joint-Stock Company RusHydro	Electric Utilities	Russia	4,972	RU000A0JPKH7	53.4	1.3%	39.3	62.4	68.1
Ormat Technologies Inc.	Renewable Electricity	United States	1,131	US6866881021	65.8	16.9%	66.2	56.9	75.8
Osaka Gas Co., Ltd.	Gas Utilities	Japan	8,121	JP3180400008	75.1	-1.6%	73.1	70.8	84.1
Pennon Group plc	Water Utilities	United Kingdom	4,228	GB00B18V8630	66.2	0.1%	64.9	73.8	59.5
Pepco Holdings, Inc.	Electric Utilities	United States	5,012	US7132911022	67.0	-1.0%	58.0	73.3	75.5
Petronas Gas Bhd	Gas Utilities	Malaysia	13,685	MYL6033OO004	47.9	1.7%	47.6	38.0	60.6
PG & E Corp.	Multi-Utilities	United States	19,387	US69331C1080	70.5	-3.2%	62.5	74.3	80.2
PGE Polska Grupa Energetyczna S.A.	Electric Utilities	Poland	11,081	PLPGER000010	51.2	-4.4%	45.8	50.5	61.8
Pinnacle West Capital Corporation	Electric Utilities	United States	5,918	US7234841010	75.6	5.8%	69.8	83.7	76.2
Portland General Electric Company	Electric Utilities	United States	2,352	US7365088472	56.3	-14.1%	43.6	59.8	75.0
Power Assets Holdings Limited	Electric Utilities	Hong Kong	17,061	HK0006000050	63.9	-11.1%	59.1	68.9	66.6
PowerGrid Corporation of India Ltd.	Electric Utilities	India	8,039	INE752E01010	52.9	4.1%	48.0	59.8	53.6
PPL Corporation	Electric Utilities	United States	19,596	US69351T1060	56.3	5.8%	45.0	58.7	73.7
PT Perusahaan Gas Negara (Persero) TBK	Gas Utilities	Indonesia	9,607	ID1000111602	59.8	4.1%	50.7	68.8	65.5
Public Power Corporation S.A.	Electric Utilities	Greece	3,542	GRS434003000	54.2	-2.2%	47.0	62.0	57.9
Public Service Enterprise Group Inc.	Multi-Utilities	United States	17,401	US7445731067	65.5	0.9%	53.7	75.6	74.7
Qatar Electricity & Water Company Q.S.C	Multi-Utilities	Qatar	5,376	QA0006929812	46.9	n.a.	38.9	49.8	58.0
Questar Corporation	Gas Utilities	United States	4,143	US7483561020	54.0	0.2%	43.2	59.4	67.1
Ratchaburi Electricity Generating Holding Public Co. Ltd.	Independent Power Produce	Thailand	2,228	TH0637010008	46.4	-5.1%	41.8	39.2	63.5
Red Electrica Corporacion S A.	Electric Utilities	Spain	9,714	ES0173093115	75.3	-2.3%	73.2	78.4	75.4
Redexis Gas Finance B.V.	Gas Utilities	Spain	n.a.	SUST0AAB322A	54.9	n.a.	53.7	53.8	58.2
Reliance Infrastructure Ltd	Electric Utilities	India	1,495	INE036A01016	56.4	10.8%	46.4	56.8	73.8
Reliance Power Limited	Independent Power Produce	India	2,766	INE614G01033	49.2	-3.7%	35.3	55.5	66.6
Reseau de Transport d'Electricite	Electric Utilities	France	n.a.	SUST6E04B9F6	61.6	2.4%	56.9	66.1	64.8
Rubis SA	Gas Utilities	France	2,456	FR0000121253	55.2	0.0%	46.9	59.5	65.0
RWE AG	Multi-Utilities	Germany	23,079	DE0007037129	69.8	0.6%	61.5	79.8	72.8
Scana Corp.	Multi-Utilities	United States	6,726	US80589M1027	59.5	3.0%	54.2	58.2	70.4
Sempra Energy	Multi-Utilities	United States	22,399	US8168511090	78.9	3.3%	69.1	89.3	84.3
Severn Trent Plc	Water Utilities	United Kingdom	7,047	GB00B1FH8J72	65.9	1.1%	63.9	64.3	71.4
SGSP (Australia) Assets Pty Ltd.	Multi-Utilities	Australia	n.a.	SUST54A8CF5F	51.8	n.a.	46.7	52.4	60.4
Shikoku Electric Power Co. Inc.	Electric Utilities	Japan	2,964	JP3350800003	58.8	1.4%	57.9	57.8	61.5
Snam SpA	Gas Utilities	Italy	18,960	IT0003153415	78.6	3.4%	76.7	75.9	85.5
Sound Global Ltd	Water Utilities	China	1,288	SG1W63939514	47.4	n.a.	42.2	49.8	54.0
Southern Company	Electric Utilities	United States	36,949	US8425871071	63.8	-4.2%	53.9	73.0	70.4
Spark Infrastructure Group	Electric Utilities	Australia	2,053	AU000000SKI7	59.7	3.5%	52.2	66.7	64.8
SPP Infrastructure Financing B.V.	Gas Utilities	Slovakia	n.a.	SUSTD6E333F1	45.1	n.a.	43.3	48.3	44.5
SSE plc	Electric Utilities	United Kingdom	21,689	GB0007908733	61.1	1.4%	56.9	64.8	64.4
Statkraft AS	Renewable Electricity	Norway	n.a.	SUST290BDFF9	72.8	-1.2%	68.2	65.4	90.2
Suez Environnement Company SA	Multi-Utilities	France	9,407	FR0010613471	78.0	10.4%	75.2	87.5	71.8
Superior Plus Corp.	Gas Utilities	Canada	1,427	CA86828P1036	55.9	n.a.	45.8	62.7	66.0
Tata Power Co. Ltd.	Electric Utilities	India	2,806	INE245A01021	65.6	16.8%	51.6	72.5	82.6
Tauron Polska Energia SA	Electric Utilities	Poland	2,691	PLTAURN00011	52.5	8.1%	43.6	56.0	64.3
TECO Energy, Inc.	Multi-Utilities	United States	3,546	US8723751009	58.1	-5.4%	48.5	64.1	68.2
Telecom Plus plc	Multi-Utilities	United Kingdom	2,399	GB0008794710	47.9	0.0%	40.0	52.3	56.8
Tenaga Nasional Bhd	Electric Utilities	Malaysia	20,145	MYL5347OO009	57.0	2.4%	44.4	67.7	66.8
TenneT Holding B.V.	Electric Utilities	Netherlands	n.a.	SUSTABCD325A	71.7	22.8%	68.8	73.3	75.0
Teollisuuden Voima Oy	Renewable Electricity	Finland	n.a.	SUST030E6319	64.4	-0.6%	57.6	69.8	70.3
TERNA - Rete Elettrica Nazionale Societa per Azioni	Electric Utilities	Italy	10,090	IT0003242622	85.4	-1.2%	80.2	89.6	89.7
The Abu Dhabi National Energy Company PJSC	Multi-Utilities	United Arab Emirates	2,378	AEA002401015	49.3	-0.5%	43.0	59.9	48.2

List of Companies Covered (cont.)

Company Name	Sub-Industry	Country	FF MCap. (m USD)	ISIN Code	Sustainalytics' ESG Score				
					Overall	YOY	Env.	Social	Gov.
The AES Corporation	Independent Power Produce	United States	10,338	US00130H1059	63.7	25.6%	54.0	67.3	76.7
Toho Gas Co. Ltd.	Gas Utilities	Japan	2,590	JP3600200004	63.2	2.7%	66.1	63.1	58.3
Tohoku Electric Power Co. Inc.	Electric Utilities	Japan	5,442	JP3605400005	66.6	10.7%	66.0	68.7	65.1
Tokyo Electric Power Co. Inc.	Electric Utilities	Japan	7,329	JP3585800000	35.0	-2.9%	30.5	31.9	46.9
Tokyo Gas Co. Ltd.	Gas Utilities	Japan	11,854	JP3573000001	69.0	3.4%	67.3	76.0	63.7
Torrent Power Ltd	Electric Utilities	India	663	INE813H01021	48.1	n.a.	41.1	55.7	51.8
Total Infrastructures Gaz France SA	Gas Utilities	France	n.a.	SUST3F0FC8C5	56.4	n.a.	55.8	53.3	61.3
Towngas China Company Limited	Gas Utilities	Hong Kong	2,927	KYG8972T1067	56.9	n.a.	51.1	60.6	62.8
Tractebel Energia S.A.	Renewable Electricity	Brazil	9,603	BRTBLEACNOR2	74.8	5.0%	66.8	78.4	85.0
TransAlta Corp.	Independent Power Produce	Canada	3,632	CA89346D1078	63.5	-10.5%	55.2	65.8	75.7
Transmissora Alianca de Energia Eletrica SA	Electric Utilities	Brazil	2,476	BRTAEECDAM10	57.3	n.a.	50.9	60.7	64.8
UGI Corp.	Gas Utilities	United States	4,959	US9026811052	48.2	1.4%	32.0	56.0	68.0
United Utilities Group PLC	Water Utilities	United Kingdom	8,394	GB00B39J2M42	74.6	10.9%	62.2	90.0	78.3
Vattenfall AB	Electric Utilities	Sweden	n.a.	SUST12976A47	77.5	12.9%	68.2	83.5	87.1
Vector Ltd.	Multi-Utilities	New Zealand	1,920	NZVCTE0001S7	57.5	0.5%	52.0	56.3	69.0
Vectren Corporation	Multi-Utilities	United States	3,011	US92240G1013	57.3	-1.0%	47.1	62.9	68.8
Veolia Environnement S.A.	Multi-Utilities	France	8,821	FR0000124141	75.0	-2.0%	84.4	65.7	69.4
Verbund AG	Electric Utilities	Austria	7,780	AT0000746409	78.6	0.8%	78.6	79.3	77.7
Vier Gas Transport Gmbh	Gas Utilities	Germany	n.a.	SUST2DA7FB2E	54.7	n.a.	52.6	56.7	56.2
Westar Energy, Inc.	Electric Utilities	United States	4,282	US95709T1007	58.5	12.4%	48.0	60.6	75.0
Wisconsin Energy Corp.	Multi-Utilities	United States	9,713	US9766571064	63.7	0.2%	53.3	68.6	76.4
Xcel Energy Inc.	Electric Utilities	United States	14,491	US98389B1008	72.4	-0.3%	63.8	78.4	80.4
YTL Corp. Bhd	Multi-Utilities	Malaysia	4,866	MYL4677OO000	52.9	-2.4%	48.0	57.1	56.8
YTL Power International Bhd	Multi-Utilities	Malaysia	3,515	MYL6742OO000	51.4	-0.7%	46.9	56.0	54.0

Appendix

Methodology – How we rate companies

Research process

The annual update of each company rating includes a thorough review of a broad range of generic and industry-specific ESG indicators. Our research is based on information disclosed by the companies themselves (such as annual reports, financial reports, CSR reports, CSR websites and press releases) and independent news sources such as (local) newspapers, relevant websites and NGO materials. A rigorous internal review process, followed by company contact and feedback, is implemented to ensure consistency and overall high research quality.

This process is complemented by the monitoring of around 20,000 news sources from around the world. Information from these sources is processed on a daily basis, with the aim of identifying those news items (so-called *incidents*) that may be significant from an ESG perspective. We monitor individual incidents, such as a lawsuit, explosion or strike, and assess them based on their impact on stakeholders and the environment (so-called *sustainability impact*) as well as on the reputational risk they pose for the company. For each incident, the sustainability impact assessment captures the severity of impacts (measured in terms of depth, breadth and duration), taking into consideration accountability and exceptionality, while the reputational risk assessment captures the notoriety and media exposure of incidents.

Key ESG issues

Our research framework broadly addresses three themes: Environment, Social and Governance (ESG). Within these themes, the focus is placed on a set of key ESG issues that vary by industry.

Industry-specific selection of key ESG issues based on a "materiality of impact" assessment

We define "key ESG issues" as industry-specific areas of exposure that are most material from a sustainability impact and/or business impact perspective and hence define the key management areas for a company. The list of issues that are potentially relevant for a company have been determined by us based on a detailed and systematic "materiality of impact" analysis of the business models and the value creation chains within a given sector. Similar to the incidents assessment, we evaluate sustainability and business impacts in terms of depth, breadth and duration of impacts.

Indicators, scoring and relative position

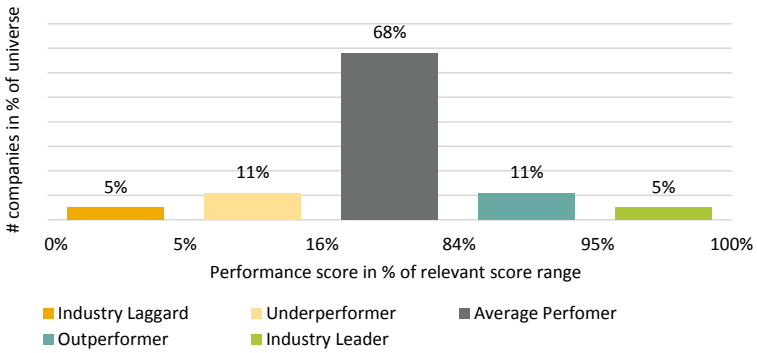
The research itself is conducted at the indicator level, where a comprehensive set of generic and industry-specific metrics is analysed, scored and weighted to determine a company's overall ESG performance. For every indicator, our analysts evaluate the degree to which a company meets relevant best practice standards.

On this basis, a "raw score" out of 100 is assigned to every indicator based on a set of detailed and well-documented internal criteria. In turn, these raw scores are aggregated based on a sector-specific weight matrix that reflects the relative importance of an issue and the related indicators.

Companies are allocated to five distinct performance groups

Based on their scores, companies are allocated to five distinct performance groups (Industry Leader; Outperformer; Average Performer; Underperformer; or Industry Laggard) according to their relative position within the respective reference universe and assuming a normal distribution of scores.

Relative position within relevant score range



Source: Sustainalytics

Types of indicators

How well do companies manage areas of exposure?

We differentiate between four types of indicators that focus on different management dimensions: Preparedness; Disclosure; Quantitative Performance; and Qualitative Performance.

Indicators cover four different management dimensions

- **Preparedness**: These indicators assess a company's management systems, policies and programmes designed to manage material ESG risks, e.g. bribery and corruption policies, environmental management systems or diversity programmes. Preparedness also includes a company's participation in relevant initiatives such as the Equator Principles.
- **Disclosure**: These indicators assess whether a company's ESG reporting meets international best practice standards and includes, for example, the ESG reporting standard and its verification, but also tax disclosure, board remuneration disclosure or CDP participation.
- **Quantitative Performance**: These indicators assess a company based on quantitative performance metrics such as, for example, carbon intensity or employee turnover rate.
- **Qualitative Performance**: These indicators assess a company's ESG performance based on an analysis of incidents, events and controversies in which the company has been involved.

Report Parameters

Reference Universe: Utilities	Global universe of Utilities (according to GICS classification); split into sub-universes developed markets (DM) and emerging markets (EM)
Weight Matrix	Default Weight Matrix Utilities
Update Financial & ESG Data	16 February 2015, data sourced from Capital IQ
Publication Date	16 March 2015

Contributions

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Glossary of Terms

Baseline

A generic assessment of the current status quo of a company's overall ESG score, controversy rating and response on a key ESG issue. We differentiate three different grades: weak, moderate and strong.

Business Impact

Assesses the magnitude of the potential impact that an ESG issue may have on the financial performance of a company. Business impact is measured on a scale between 0 and 10.

Controversy

A 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 subtheme level. Controversies are rated from Category 0 (no controversy) to Category 5 (severe). Each controversy indicator consists of a bundle of event indicators.

Default Weight Matrix

Weight Matrix proposed by Sustainalytics.

Developed Markets (DM)

Sub-universe including companies from: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom and United States.

(Management) Dimension

To assess a company's ability to address different kinds of ESG-related risks and opportunities, all indicators used by Sustainalytics can also be attributed to the four (management) dimensions: Disclosure; Preparedness; Quantitative Performance; and Qualitative Performance. For each dimension we calculate a dimension score, multiplying the relevant indicators with their respective weights and transforming the result so that the highest reachable score is 100 and the lowest 0.

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.

Emerging Markets (EM)

Sub-universe, including companies from: Argentina, Bahrain, Bangladesh, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Egypt, Estonia, Greece, Hungary, India, Indonesia, Jordan, Kazakhstan, Kenya, Kuwait, Lebanon, Lithuania, Malaysia, Mauritius, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Russia, Serbia, Slovenia, South Africa, South Korea, Sri Lanka, Taiwan, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates and Vietnam.

Event

A series of incidents that refers to the same controversial topic, tracked in one events indicator; for example, "labour relations" or "environmental impact of products". An event assessment is based on the highest impact or risk score assigned to the related incidents. Events are rated on a scale from Category 0 (no event) to Category 5 (severe).

EXPOSURE

Defines an area of potential impact a company faces due to its business activities. Exposure to key ESG issues is assessed at an industry 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 the 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 like, 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.

KEY ESG ISSUE

Industry-specific areas of exposure that are most material from a sustainability impact and/or business impact perspective and hence define the key management areas for a company. The list of issues that are potentially relevant for a company have been determined by us based on a detailed and systematic "materiality of impact" analysis of the business models and the value creation chains within a given sector.

KEY INDICATOR

An industry-specific ESG indicator that we regard as most important to assess how well a company manages areas of exposure as reflected by the identified key ESG issues.

MOMENTUM

Development of historical scores for -1, -2 and -3 years from the reference date. Note: The industry average calculation is based on the current company universe. Defaulted companies are not part of the calculations.

OUTLOOK

A forecast on how a company's overall ESG score, controversy rating or response on a key ESG issue will change over the next 12 months. For the sector report, we differentiate five different grades: ↑ very positive; ↗ positive; → neutral, ↘ negative and ↓ very negative.

OVERALL ESG SCORE

Evaluates a company's overall ESG performance on a scale of 0–100, based on generic and industry-specific ESG indicators that are grouped in three (ESG) themes and four dimensions, derived by multiplying the raw scores for the relevant indicators with the respective weight matrix.

PREPAREDNESS

Assesses a company's management systems, policies and programmes designed to manage material ESG risks, such as bribery and corruption policies, environmental management systems or diversity programmes, for example. It also includes a company's participation in relevant initiatives, such as the Equator Principles.

QUALITATIVE PERFORMANCE

Assesses a company's ESG performance based on an analysis of incidents, events and controversies in which the company has been involved.

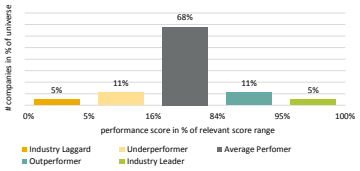
QUANTITATIVE PERFORMANCE

Assesses a company based on quantitative performance metrics such as, for example, carbon intensity or employee turnover rate.

RAW SCORE

Score between 0–100 that assesses the performance of a company for a single ESG indicator.

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, and 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.

RISK

Refers mainly to the reputational risk a company is exposed to and forms one part of a company's incident assessment. The reputational risk assessment captures the sustainability impact, notoriety and media exposure of incidents and is measured on a scale between 0 and 10.

SECTOR

Sustainalytics analyses 42 different sectors, grouped in 14 industries. The sector definitions are by and large aligned with the GICS classification for industry groups (level 3).

SUBTHEME

Sub-division of the three ESG themes in:

- Environment: Operations, Contractors and Supply Chain (Env), Products and Services (Env);
- Social: Employees, Contractors and Supply Chain, Customers, Society and Community, Philanthropy;
- Governance: Business Ethics, Corporate Governance, Public Policy.

SUSTAINABILITY IMPACT

Assesses the magnitude of potential impact on stakeholders, including environment and society that may be caused by a company's activities. The sustainability impact assessment captures the severity of impacts (measured in terms of depth, breadth and duration), taking into consideration accountability and exceptionality. Sustainability impact is measured on a scale between 0 and 10.

(ESG) THEME

The three sustainability areas Environment (E), Social (S) and Governance (G). For each theme we calculate a theme score, multiplying the relevant indicators with their respective weights and transforming the result so that the highest reachable score is 100 and the lowest 0.

WEIGHT MATRIX

A matrix containing the weights with which individual indicators are multiplied to calculate the overall ESG score for a company. Weights are sector-specific, reflecting the relative importance of indicators for companies within the respective sector. The weight matrix may be adjusted at the company level if an indicator is disabled due to company-specific reasons (e.g. specifics of the business model). Note: Weight matrices are customisable by our clients. The matrix proposed by Sustainalytics is called the Default Weight Matrix.

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