

Investor Expectations of Electric Utilities Companies

Looking down the line at carbon
asset risk





The Institutional Investors Group on Climate Change (IIGCC) is a forum for collaboration on climate change for investors. IIGCC's network includes over 120 members, with some of the largest pension funds and asset managers in Europe, representing €13 trillion in assets. IIGCC's mission is to provide investors a common voice to encourage public policies, investment practices and corporate behaviour which address long-term risks and opportunities associated with climate change.

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IGCC is a collaboration of over 60 Australian and New Zealand institutional investors and advisors, managing over \$1 trillion in assets under management and focusing on the impact that climate change has on the financial value of investments. IGCC aims to encourage government policies and investment practices that address the risks and opportunities of climate change.

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The Asia Investor Group on Climate Change (AIGCC) is an initiative to create awareness among Asia's asset owners and financial institutions about the risks and opportunities associated with climate change and low carbon investing. AIGCC provides capacity for investors to share best practice and to collaborate on investment activity, credit analysis, risk management, engagement and policy. AIGCC represents the Asian voice in the evolving global discussions on climate change and the transition to a greener economy.

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Executive Summary

Institutional investors recognise that climate change will impact their holdings, portfolios and asset values in the short, medium and long term. Climate change is an important issue for investors and for the clients and beneficiaries upon whose behalf they invest. Due to their carbon intensive nature, electric utilities are of particular concern since, following liberalisation of many electricity markets, electric utilities now form a meaningful proportion of many indices – representing hundreds of billions of dollars in market capitalisation.

Institutional investors are concerned that some companies are not sufficiently prepared for the transition to a lower carbon economy. Business strategy and capital allocation decisions made now will determine the future sustainability and profitability of the utility sector for decades to come.

This document sets out guidance for constructive engagement by investors with the boards and management of electric utilities.

The aim is to stimulate and facilitate meaningful discussion of risks and opportunities related to climate change and appropriate strategies, in order to mitigate the long term risks to us as investors.

Changing technology dynamics

The traditional business models of power generators and distributors are challenged by the transition from a centralised system of major plants feeding a national grid into a more complex and distributed structure with many small and locally installed sources of (renewable) supply. Global ambition to limit the global temperature increase to well below 2 degrees C will only accelerate the growth of distributed generation through renewables such as solar and wind, a shift in demand due to increasing energy efficiency, a more modest GDP outlook and new technologies for energy services, management and storage.

Changing policy dynamics

The Paris Climate Agreement provided an unequivocal signal that collective global effort must now focus upon limiting climate change to 2 degrees C or less by 2050. A raft of regulations already exist but heightened ambition will tighten policy for the utilities sector. These regulations include specific carbon reduction targets, incentives to increase renewable energy generation, demand side energy savings and carbon pricing, alongside more indirect requirements for disclosure and water management.

Changing demand dynamics

Other changes in demand patterns driven by corporate direct power purchases, demographic and economic shifts and retirement of legacy assets are also having complex impacts on traditional business models in the sector. In this context, electric utilities need to design new business strategies and seize opportunities elsewhere to focus on cleaner power generation, networks, customer retention and energy services.

Six Investor Expectations of Electric Utilities Companies

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Introduction

As institutional investors we recognise that climate change will have an impact on our holdings, portfolios and asset values in the short, medium and long term. Climate change is an important issue for us and for the clients and beneficiaries upon whose behalf we invest. As the single most greenhouse gas – emitting sector in the MSCI World Index¹, electric utilities are of particular concern and as a result of the liberalisation of electricity markets, electric utilities now form a meaningful proportion of many indices – representing hundreds of billions of dollars in market capitalisation.

Post the historic Paris Climate Agreement, institutional investors are concerned that some companies are not sufficiently prepared for the transition to a lower carbon economy. Business strategy and capital allocation decisions made now will determine the future sustainability and profitability of the utility sector for decades to come.

Purpose

The purpose of this document is to provide investors with a guide for constructive engagement with boards and management of electric utilities. We aim to stimulate and facilitate meaningful discussion of risks and opportunities related to climate change and appropriate strategies, in order to mitigate the long term risks to us as investors. This document may be used by investors in their dialogues with electric utilities if deemed necessary, and in conjunction with the previously released *Institutional Investors' Expectations of Corporate Climate Risk Management*.²

Box 1 Lack of transparency in the utilities sector

Lack of transparency about carbon emissions, water use and long-term strategy is a serious issue in the utilities sector in many jurisdictions, impacting investors' ability to calculate their portfolio's carbon intensity, assess carbon asset risk and evaluate dependence upon (reliable) water resources. By market capitalisation, only 45% of US electric utilities and 25% of electric utilities outside of the US and Europe reported carbon emissions to investors via CDP last year, compared with 85% of European electric utilities.³

As more investors seek to measure their carbon footprints, the provision of consistent and reliable data is a growing demand.⁴ The lack of credible data in this area is recognised globally. To address this problem G20 Finance Ministers have asked the G20's Financial Stability Board to convene dialogues with public and private sector participants to review how to improve company disclosures in order that financial market participants may better understand their climate-related risks. For energy companies, investors have called for public disclosure and comprehensive methodologies for 2 degrees scenario stress testing.⁵ The G20's Task force on Climate-Related Financial Disclosures (TCFD) has pledged to release guidance at the end of 2016.

¹ http://www.robecosam.com/images/Investing_in_response_to_climate_change.pdf (page 6)

² <http://www.iigcc.org/publications/publication/institutional-investors-expectations-of-corporate-climate-risk-management>

³ CDP (May 2015) "Flicking the switch: Are electric utilities prepared for a low carbon future?"

⁴ Over 120 investors have signed the Montreal Carbon Pledge, committing to publicly disclose the carbon foot print of their equities portfolios. <http://montrealpledge.org/>

⁵ Global Investor Coalition letter to FSB Task force on climate-related financial disclosures. 25 March 2016. www.iigcc.org/publications/publication/gic-disclosure-letter

Changing dynamics in the electric utilities sector

The traditional business models of power generators and distributors are challenged as we see a trend from a centralised system of major plants feeding a national grid into a more complex and distributed structure with many small and locally installed sources of (renewable) supply.⁶ Based on environmental considerations such as keeping the global temperature increase to well below 2 degrees C, we anticipate the continued growth of distributed generation through renewables such as solar and wind. Thus challenging existing baseload resources and thereby compounding pre-existing overcapacity in many developed power markets. Coupled with low demand due to increasing energy efficiency and modest GDP growth, traditional centralised power generation is being pushed out of the merit order and will ultimately need to be shut down or receive capacity payments (for market backup). In developing markets, which are currently witnessing the greatest demand growth, the energy system has the potential – and in many cases is already demonstrating a capacity – to leapfrog directly into a cleaner and more distributed electric infrastructure.

Furthermore, electric utilities are highly dependent on a stable supply of good quality fresh water – significant amounts of water are needed in almost all energy generation processes, from generating hydropower, to cooling and other purposes in thermal power plants, to extracting and processing fuels. Yet the UN predicts a global shortfall in water supply of 40% by 2030. Unsurprisingly, it's already clear that the worsening water security is threatening the long-term viability of energy projects worldwide. Last year alone, water shortages shut down thermal power plants in India, decreased energy production in US power plants and threatened hydropower capacity in many countries, including Sri Lanka, China and Brazil.

In this context, electric utilities need to design new business strategies and seize opportunities elsewhere to focus on cleaner power generation, networks, customer retention and energy services. However, with new technologies, this journey is not without risks. New entrants such as Google (via Nest) start to propose power management solutions and become new competitors. As investors, we need to know how electric utilities will deal with the vast shift already underway within their industry, how they will address the considerable risks posed by these trends and how they plan to profit from emerging opportunities.



⁶ Including individual installations (rooftop solar), wind farms, solar arrays, micro grids, hydro, etc.

Policy dynamics

The Paris Climate Agreement sent a clear message for a collective global effort to limit climate change to 2 degrees C. A raft of regulations already exist and we anticipate tightening policy with significant direct impact on the utilities sector, particularly in Europe.⁷

These regulations include specific carbon reduction targets, incentives to increase renewable energy generation, demand side energy savings and carbon pricing, alongside more indirect requirements for disclosure and water management (see Box 2 for details).

Box 2 Regulations impacting the electric utilities sector

1 National and state level greenhouse gas (GHG) emissions reduction targets

- During the negotiations that led to the COP 21 climate agreement, 198 countries set emissions reduction targets in the form of Intended Nationally Defined Contributions (INDC's). Many of these INDC's reflect national targets and regulatory packages that have been in place for years. For example the EU's goal to decarbonise the electricity sector by between 80-95% by 2050 is broadly in line with a 2 degree global target, although it may need more intermediary targets to be realised.
- In the U.S., the Environmental Protection Agency has issued the Clean Power Plan, which sets GHG reduction goals for power plants in each state, and aims for a 32% reduction below 2005 levels by 2030.
- Australia is targeting emission reductions of 26-28% by 2030 from 2005 levels, with electricity comprising the largest source of emissions.⁷

2 Incentives to increase renewable energy consumption

- As part of the EU's 20/20/20 package (and subsequent 2030 Climate and Energy Package) there are three pillars of EU Energy policy: GHG reduction, development of more renewables and better energy efficiency. A target to supply 20% of the EU's electricity demand by 2020 from renewable sources was a driver for the growth of solar across the EU, which is now competitive without subsidies in sunny countries such as Spain. According to the IEA, renewables have met 62% of growth in capacity in OECD Europe since 2000.⁸ The increase in renewable capacity coupled with falling energy demand has crashed prices and crushed revenues for some of Europe's major utilities.⁹ The European Commission is currently preparing a communication on how energy markets can be retooled so that they can absorb an even greater share of renewable energy.
- In the U.S., 29 states have renewable portfolio standards (RPS's), with California's aiming for 50% renewable electricity by 2030. The federal government also provides tax benefits for solar and wind power. This has led to a fundamental rethink in the way energy is delivered, spurring related work on the design of a new energy market.
- Australia's Renewable Energy Target (RET) is a Federal Government policy designed to ensure that at least 33,000 Gigawatt-hour (GWh) of Australia's electricity comes from renewable sources by 2020 (equating to approximately 20%). The RET was reviewed by the Government and reduced in June 2015 from the previously legislated 41,000 GWh to 33,000 GWh. Amendments to the RET created significant industry and investor uncertainty, with new investment in renewable energy projects still extremely challenging as a result.

⁷ Barclay's estimates that the EU is in a strong position to reach its 2030 target of reducing GHG emissions by 40%. Mark Lewis "German Utilities Two Degrees of Separation" (2016) <https://live.barcap.com/PRC/servlets/dv.search?contentPubID=FC2218778&bcLink=decode>

⁸ Australian Department of the Environment, 'Tracking Australia's Greenhouse Gas Emissions' <http://www.environment.gov.au/climate-change/greenhouse-gas-measurement/tracking-emissions>

⁹ IEA (2016) "Repowering Markets" <https://www.iea.org/newsroomandevents/pressreleases/2016/february/how-to-reinvent-electricity-markets-after-cop-21.html>

¹⁰ Carbon Tracker Initiative, "Coal: Caught in the EU Utility Death Spiral" (June 2015) Available at: http://www.carbontracker.org/report/eu_utilities/

3 Demand and supply side energy saving policies

- Energy efficiency improvements since 1990 delivered savings of 2,200 terawatt hours (TWh) during 2014 in International Energy Agency (IEA) member countries, equaling about 24% of total electricity demand.¹⁰
- EU Energy Efficiency Directive and Energy Performance of Building Directive (EPBD)
- 24 US states have energy efficiency resource standards (EERS's), with specific energy savings goals. Energy efficiency is also an option for compliance with the Clean Power Plan.
- The Australian National Energy Productivity Plan 2015-2030 is aiming to improve energy productivity by 40%¹¹ through a range of measures.

4 Carbon pricing

- Recent estimates by HSBC suggest that countries covering 51.4% of all GHG emissions in 2012 already have carbon taxes in place, while 15.2% of 2012 GHG emissions were covered by an emissions trading scheme. The bank also notes that new supporters of carbon pricing include China and Switzerland, which could lend political support for the development of a global mechanism in the future.¹²
- Managing carbon prices and taxation in different markets will therefore become a growing concern to utilities companies. While companies may think they can pass this cost through to customers, there might be industrial clients and consumer groups that don't accept this approach.
- Within the EU carbon pricing imposed by the EU emissions trading scheme (ETS) has had little effect on utilities because the price this sets has been so low. EurElectric, the European Utility trade association favours carbon pricing as the most efficient way to meet emission reduction targets. However energy efficiency and renewable energy targets are undercutting the carbon price currently set by EU ETS.
- In New Zealand, transitional measure to accompany the introduction of the New Zealand Emissions Scheme (NZETS) has seen sustained low prices with minimal impacts for utilities. The scheme review currently underway is proposing to wind back support measures with likely flow-through price impacts for utilities.¹³

5 Local developments disclosure regulations

- Article 173a in the recently passed French Energy Transition Law requires investors to disclose how their investments are aligned with a 2 degree world and assigns responsibility for this to a member of the board. This not only sets a precedent for 2 degree disclosure regulation, it also means that more investors will now expect companies to provide this information as a matter of routine corporate reporting.

6 Regional water resource management

- Governments are seeking to shore up their water resources management in order to deliver improved water security. For example, the state agencies of California and New York have taken policy-related actions in the recent past to address the impact of power plants on state water resources and the potential environmental impacts of their cooling systems. Some of these initiatives have already placed the utility companies' licence to operate at risk.

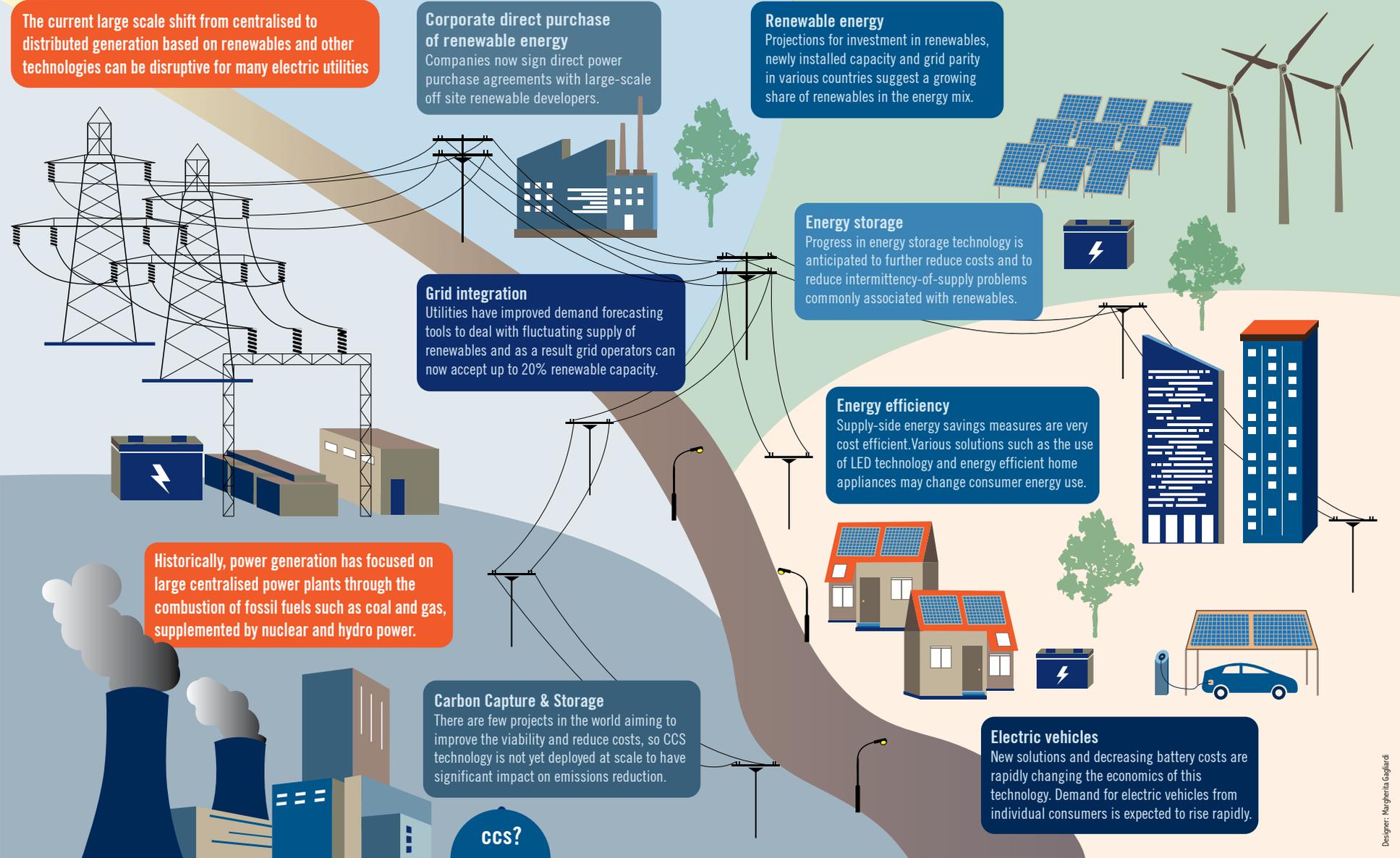
¹¹ IEA (2015) Medium term energy efficiency market report <https://www.iea.org/publications/freepublications/publication/MediumTermEnergyefficiencyMarketReport2015.pdf>

¹² National Energy Productivity Plan, <https://scer.govspace.gov.au/files/2015/12/National-Energy-Productivity-Plan-release-version-FINAL.pdf>

¹³ HSBC Global Research "Carbon Pricing: Paris agreement supports scale up of carbon pricing." 17 February 2016. <https://www.research.hsbc.com/R/20/vxGZCcnOCApP> Ashim Paun, Zoe Knight, Wai-Shin Chan.

¹⁴ New Zealand Emissions Trading Scheme Review 2015/16: <http://www.mfe.govt.nz/publications/climate-change/new-zealand-emissions-trading-scheme-review-2015-16-discussion-document>

Technology dynamics and disruptive change in the utilities sector



Designer: Margherita Gugliardi

Demand dynamics

Trends in energy demand impacted by climate, renewable energy and environmental factors are having complex effects on the traditional business model of electric utility companies.

Corporate demand

- **Corporate direct purchase of renewable energy** – In a recent development corporations started to go around the back of electric utilities by signing direct power purchase agreements with large-scale off site renewable developers. This shift could represent a major threat to utilities demand from large clients. According to the Rocky Mountain Institute, in November 2015 this represented 2 GW of power, up from 1.2 GW for all of 2014.¹⁵
- **Corporate commitments to renewables** – Over 55 major corporations globally have committed to source 100% of their power from renewable sources in the next two decades.¹⁶ The US Environmental Protection Agency (EPA) maintains a list of companies that qualify as 100% green power users, combined green power use of these 763 organisations amounts to more than 15.9 billion kilowatt-hours of green power annually.¹⁷

Shifts in growth markets

- In most developed markets, growth in energy demand has been flat or is even declining. In Europe for example demand and power prices have gone negative due to decreasing populations, increasing energy efficiency and over supply of renewables. Thus, electric utilities increasingly look for growth in emerging markets. However, it is important to balance (short term) economic benefits with longer term social and environmental impact.

Interactions with other sectors

- UBS estimates rapid decline in cost for battery storage (>50% by 2020) and increased EV penetration (10% EV and plug-in hybrid penetration in Europe by 2025.) UBS's proprietary model suggests a payback time as low as 6-8 years for a combined EV + solar + battery investment by 2020 – unsubsidised. For utilities companies, this pattern of change would make large scale generation obsolete, and key assets for utilities would become smart distribution networks and customer services.¹⁸

Legacy assets

- Utility companies still have large numbers of high-carbon power plants on their balance sheets. Their future value will depend upon how the transition away from high-carbon high-water use electricity generation is managed by policy-makers. Already, we are seeing the mothballing of gas plants across the European Union because the increased take-up of renewable energy makes the operation of gas plants uneconomical. In the longer run, we might see cheaper gas prices, combined with additional regulatory measures against coal plants, which could lead to the early closure of coal plants (as is already happening in the UK). Nevertheless, we can expect most European markets to continue to be characterised by overcapacity.
- Even more crucial will be the allocation of nuclear decommissioning cost between utility companies and governments. For example, the German utility companies who will have to close their nuclear assets prematurely due to the Energiewende are currently negotiating with the German government about their future decommissioning liabilities. Since German law has banned the utility companies from spinning their nuclear liabilities off into a separate company – where they would have been placed with other legacy assets – the future of the utility companies will depend crucially on who pays for decommissioning and storage of nuclear waste.

¹⁵ <http://blog.rmi.org/>

¹⁶ <http://www.theclimategroup.org/what-we-do/programs/re100/>

¹⁷ <http://www3.epa.gov/greenpower/toplists/partner100.htm>

¹⁸ UBS (2014) "Global Utilities, Autos & Chemicals: Will solar, batteries and electric cars re-shape the electricity system?"

Investor expectations

In order to ensure a robust long-term business strategy based on a resilient portfolio of assets, as well as to encourage a smooth transition to a lower carbon and more resource efficient system, this guide sets out expectations and key questions for the boards of utility companies to consider. We expect boards and senior management of electric utilities to make decisions in the long term interests of their investors, 'stress testing' their business strategy under changing policy, demand and technological scenarios in order to deliver value for the next decade and beyond.

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1 Governance

EXPECTATION

We expect electric utilities to clearly define board and executive management responsibilities, capabilities and processes for managing the transition to a low-carbon, resource efficient power system. We expect senior accountability for managing climate-related risks and opportunities and for setting a viable long term strategy.

QUESTIONS

Organisation

- Who is responsible for managing climate risk?
- How are the impact of regulatory changes and disruptive technology factored into business strategy and what expertise is drawn upon?

Remuneration

- Do metrics used to determine remuneration consider climate change, environmental risks and opportunities including managing the transition to a decentralised, resource efficient energy system?

2 Decarbonisation Strategy & 2 degree stress testing

EXPECTATION

We expect electric utilities companies to have a clear long-term decarbonisation strategy (i.e. from coal to gas to renewables) reflected in decreasing carbon intensity and including plans for dealing with a future carbon price that more accurately prices the negative externalities of carbon emissions. We acknowledge that traditional power generation will continue to play a role in the energy mix for some years to come. However, we would like to see a 2 degree (or 1.5 degree) stress test or published assessment setting out how a company's portfolio is consistent with this trajectory.

QUESTIONS

Future power generation mix

- What is the company's actual and projected generation mix? Does the company have energy efficiency and GHG emission reduction targets in place? How does the company track performance against these targets both for the company overall and per fuel type? Are the targets aligned with national and international science-based targets for GHG reduction?
- Does the company use an internal or shadow carbon price to influence business decisions? Is this public?
- How are the capital expenditures plans determined and how are they split between regulated and unregulated returns and different energy investments

Scenarios

- Has the company undertaken a 2 degree (or 1.5 degree) scenario stress test?
- Does the company assess the impacts of such scenarios on the company's full portfolio of power generation assets and planned capital expenditures through 2040, including the financial risks associated with such scenarios?
- How robust is the strategy in relation to technology such as a rise in energy storage possibilities or to changes in water availability?

Management of legacy assets

- Is there a timeline for the phase out of coal-fired power plants?
- How is the company revaluing assets as projected closure dates approach to avoid large, sudden write-downs?
- How is the company managing capital provisioning for site remediation?



3 Consumer-facing strategy

EXPECTATION

The rise of distributed generation presents both challenges and opportunities. We expect electric utilities to consider how their strategy could diversify their revenue streams (e.g. energy services), monetise retail customer base, capitalise on digitalisation (e.g. Smart Home) and/ or invest in grid efficiency and flexibility.

QUESTIONS

Business model innovation

- Does the company offer demand response and energy efficiency programs to customers? Is the company growing its energy services business? Are there any plans to compete directly or develop business partnerships to promote distributed generation (e.g. through entering the rooftop solar business) or energy efficiency and what are the regulatory hurdles (if any) to doing so?
- Does the company have a comprehensive client relationship management approach (e.g. regular client satisfaction measurement)
- What is the Smart Meter penetration amongst the company's client base? And how closely is the performance of this new technology being evaluated with customers?
- Does the company offer demand response and energy efficiency programs to customers? Is the company growing its energy services business? How much electricity does the company help its customers save as a percent of total electricity sales?
- What is the capital expenditure level for smart grids and energy storage solutions?

4 Operational efficiency and natural resource management

EXPECTATION

We expect electric utilities to strive for operational excellence at their thermal generation assets. This includes having quantified thermal efficiency targets, upgrading coal-fired power plants to higher thermal efficiency plants and sourcing coal responsibly. Using other resources sustainably, including water, is of growing importance to the sector as growing water insecurity and regulatory uncertainty can materially impact operations.¹⁹

QUESTIONS

Upgrade of coal-fired power plants

- What are the thermal efficiency rates per plant and on group level and forward targets?
- What technologies are employed e.g. abatement technologies for GHG, VOC, mercury and selective catalytic reduction (SCR) technology in company's coal-fired power plants/ co-generation (combined heat and power) / biomass co-firing?

Water use

- Has the company assessed the physical, regulatory and reputational water risks within the water catchments or basins where you (will) operate or buy electricity supplies from over the next 20 years?
- What proportion of the company's current and future assets are exposed to water risks? Do you report these risks and opportunities?

¹⁹ According to CDP, half of all respondents in the Utilities sector experienced detrimental impacts related to water in the reporting year, the highest of any sector. CDP "From water risk to value creation" (2014)

5 Public policy

EXPECTATION

We expect electric utilities to ensure broad oversight and transparency of their positions regarding any relevant environmental legislation and of any lobbying activities directly or via trade associations or political spending at the national and international level. Where companies have come out in broad support of carbon pricing or the Paris Agreement, they must also engage with policy makers in support of cost-effective policy measure to mitigate climate change risks and support low carbon investments. They should likewise ensure that the company does not lobby against these positions, directly or indirectly via associations it belongs to.²⁰

QUESTIONS

Policy positions

- What is the company's position on specific matters of climate and energy policy (e.g. capacity payments, renewables subsidies, energy-efficiency targets, carbon price, carbon tax, reform to local carbon markets, GHG reduction targets)?
- How are these positions made public?
- Is the company playing a leadership role to help ensure policy makers determine sustainable policies that will serve the long-term interests of investors?

Activity

- How does your company conduct engagement with policy makers on a national and international level?
- How much is spent on lobbying activity and how is this spending broken down?
- Describe the company's engagement with policy makers directly on specific climate and energy and water policies described above?

Alignment

- What industry associations does your company have links with (including trade associations, chambers of commerce and business forums)?
- What is the governance process for managing these relationships?
- Does the company participate in any committee or hold board level roles at these trade associations or in other high profile fora?
- What are each association's positions on specific climate and energy and water policies (e.g. capacity payments, renewables subsidies, energy-efficiency targets, carbon price, carbon tax)?
- How do you ensure consistency between the company's own public positions on climate change or water security and those articulated by your trade associations and what actions are you prepared to take where there is a misalignment?

²⁰ A group of 53 investors representing more than \$US 3.3 trillion in AUM have recently released a statement addressed to companies asking for consistent policy engagement in support of a safe climate which protects long-term investment value – see Investor Expectations on Corporate Climate Lobbying <http://unpri.org/corporateclimatelobbying>

6 Transparency & disclosure

EXPECTATION

We expect electric utilities to disclose in annual reports and/or on their corporate website or through CDP, the company's view of and response to the substantial changes in their industry, what kind of scenarios and assumptions are being used, how the risks are addressed and how the company plans to profit from arising opportunities in response to the expectations and questions outlined in the document above. This information should be disclosed in a timely and complete manner.

Using CDP data points to engage with companies on expectations and questions in this guide:

- To help investors identify relevant information on carbon asset risk within CDP's dataset and to better inform their engagement activities with utilities companies, CDP has prepared a document which links relevant questions from CDP's 2015 climate change and water questionnaires with the expectations and guiding questions in this guide for investor expectations of utilities companies. Key related questions are noted here for reference.
- The CDP Linkage table is available online at: <http://www.iigcc.org/publications/publication/linking-cdp-and-gics-investor-expectations-of-utilities-companies>
- The number of electric utility company responses received by CDP in 2015 to the questions highlighted in the table below is indicated in parentheses. In total, 94 out of 325 invited electric utility companies responded to CDP's 2015 climate change questionnaire, and 31 out of 92 invited electric utility companies responded to CDP's 2015 water questionnaire. This year, companies have till 30 June, 2016, to respond to CDP's 2016 climate change and water questionnaires.

