



Action Report Environment (Climate Change)

Duke Energy
April 11, 2017

Ticker	Exchange	Meeting Date	Record Date	Annual Meeting Location
DUK	NYSE	5-4-17	3-6-17	Exclusively online via live webcast

Agenda

Item	Proposal
1	MGT: Elect directors
2	MGT: Ratify accountants
3	MGT: Advisory vote on executive compensation
4	MGT: Advisory vote on frequency of executive compensation vote
5	MGT: Amend supermajority requirements
6	SH: Report on lobbying
7	SH: Report on climate change strategy
8	SH: Report on coal ash risks

Si2 Briefing [Environment \(Climate Change\)](#)

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Links [2017 Proxy Statement, 2016 Form 10-K](#)

Vote History This is the first time Duke Energy shareholders will consider either of these proposals. Last year, different proponents presented two related proposals, neither of which ultimately appeared on the ballot. One proposal requested a report on distributed energy, while the other sought a report on climate change strategy, much like this year's. The SEC agreed last year with the company's contention that the proposal about climate change strategy concerned ordinary business, thus allowing Duke to omit it, but did not agree with this argument with regard to the distributed energy resolution. The proponent withdrew that proposal after the company agreed to report on challenges associated with renewables and distributed generation. This year, Duke Energy did not challenge either of the resolutions with the SEC.

Item 7

Resolved Clause Resolved: Shareholders request that Duke Energy, with board oversight, publish an assessment (at reasonable cost and omitting proprietary information) of the long term impacts on the company's portfolio, of public policies and technological advances that are consistent with limiting global warming to no more than two degrees Celsius over pre-industrial levels.

Lead Proponent New York State Common Retirement Fund

Summary Duke Energy is the biggest utility in the country, and relies substantially on coal for its generation. The proponent believes that traditional electric utility business models are at risk from global climate change and the various responses to it. The proponent says the rapid expansion of alternative energy technology is creating new risks, and wants to know how the company is preparing for these, particularly as concerns efforts to constrain global warming to 2 degrees Celsius. Duke Energy says that it has already taken significant steps to improve its efficiency and reduce air emissions, and that it performs better than its peers in this regard. The board argues that its legally mandated resource planning process addresses many of the proponent’s concerns, and that information on the balance is available in other public disclosures.

Item 8

Resolved Clause Resolved: Shareholders request that Duke Energy publish a report assessing the public health impacts of its coal use on rates of illness, mortality, and infant death, due to coal related air and water pollution in communities adjacent to Duke’s coal operations, and provide a financial analysis of the cost to the Company of coal-related public health harms, including potential liability and reputational damage. The report should be published by 2018, at reasonable expense, and omit proprietary information.

Lead Proponent As You Sow

Summary The proponent is concerned about the environmental and social costs of coal ash, and questions Duke Energy’s ongoing use of coal as a fuel source, particularly as regards the disproportionate impact on communities of color, an issue raised in a U.S. Civil Rights Commission report. As You Sow seeks a report on coal’s public health impacts, as well as the financial liability that accompanies these. Duke’s board responds that the company is a leader in coal ash management, and plans to close all of its North Carolina ash basins by 2029. Management says that it already substantially discloses all of the information the proponent requests. The board does not address the concern related to communities of color.

I. Challenges to Electric Utility Business Models

Electric utilities are facing unprecedented external and internal challenges to traditional business models. Technological change and associated new market entrants, climate change regulation and shifting consumer demands are putting pressure on traditional electrical generation, transmission and distribution. Fossil fuels—particularly coal—are becoming increasingly expensive to exploit. Energy efficiency and other demand-side resources are now cheaper than conventional generation in many cases. Renewables—particularly solar and wind—outcompete fossil fuels in many instances, and generally are approaching grid parity.¹ Many utilities are also experimenting with electricity storage, thanks to very rapid advances in the technology. Electricity generation, transmission and delivery is growing increasingly decentralized, electricity is no longer necessarily consumed immediately and formerly high barriers to market entry are eroding.

Distributed generation² of electricity has proliferated in many states. Residential rooftop solar is expanding rapidly as costs for solar panels decrease and companies such as **Solar City** and **First Solar** expand. Many environmental activists and utility sector analysts see distributed generation as a critical element of the electric grid of the future. Key advantages they point to are *reduced emissions* from prevented

¹ Grid parity occurs when new energy sources can generate power at a cost less than or equal to the price of purchasing power from the existing electricity grid.

² Distributed generation refers to power generation at the point of consumption. It usually involves renewable energy sources, particularly solar, and is thus intimately connected to the topic of renewable energy uptake.

generation, *cost advantages* to owners, *efficiency gains* in the form of decreased transmission loss, *resilience* that comes from independence from an interconnected grid that is otherwise subject to cascading outages and *modularity* that enables renewable energy source integration. A November 2014 [report](#) from Moody's credit rating agency indicated that "a proactive regulatory response to distributed generation is credit positive as it gives utilities improved rate designs and helps in the long-term planning for their infrastructure."

Others question the value of distributed generation proliferation in the current framework. Some scholars at the Massachusetts Institute of Technology (MIT) who have been skeptical about distributed solar assets' usefulness recently published a [report](#) suggesting large-scale, utility-controlled solar assets may make better long-term economic sense. MIT's report warns regulators that they must:

minimize distortions from charges that are designed to collect taxes, recover the costs of public policies [including subsidies for renewable energy [and] cross-subsidies between different categories of customers, etc.), and recover residual network costs (i.e., those network costs that are not recovered via cost-reflective charges).

This admonition is based on the difficulty utilities face under traditional regulatory structures, where their costs for grid maintenance are recovered from customers' charges, which are largely volumetric. In general, customers generating their own solar power, for instance, are entitled to electrical grid access to draw power during times of insufficient generation and to sell power back to the grid in times of excess, yet such customers will pay less for grid availability because of lower usage. On net, this can result in the utility receiving less in fees than it costs to keep that customer connected to the grid. In some cases, customer rates (i.e. cost per unit of electricity) would increase substantially if the same fixed costs for grid services were applied to lower volumes of usage. Importantly, these challenges are not necessarily an inherent problem with distributed generation, but rather largely with the cost recovery mechanisms that regulators have put in place for utilities. A number of experts, regulatory officials and utilities have described rate solutions to such problems. These rate structures could be changed.

The uptake of renewable energy has suddenly increased significantly. Although photovoltaic cells and wind turbines were invented nearly 150 years ago, they still only generate roughly 7 percent of the world's electricity. However, while essentially peripheral to our energy system a dozen years ago, these sources of energy are now growing more quickly than any other, and their costs continue to fall relative to fossil fuels. BP expects renewables to account for half of global energy supply growth in the next 20 years, and the U.S. Energy Information Agency (EIA)'s [2017 Annual Energy Outlook](#) projects that renewable energy will surpass coal and nuclear globally by 2040. In 2016, wind energy capacity [grew](#) by 19 percent in the United States, while its price plummeted. It has surpassed hydropower as the country's most plentiful renewable energy source. Momentum for that construction came not just from utilities aiming to meet renewable energy mandates, but because power companies saw economic reasons to invest in wind. According to a March 2017 [analysis](#) by Moody's Investor Services, some 56 gigawatts of U.S. coal-fired generation in the Midwest is at risk as wind energy comes online with lower costs. The average cost of wind power in the Great Plains states has fallen to around \$20 per megawatt hour (MWh), while coal-fired generation runs at about \$30 per MWh.

A February 2017 [article](#) in *The Economist* notes, however, that we face a tough journey from here to there. Specifically, the transition will require:

huge amounts of investment over the next few decades, to replace old smog-belching power plants and to upgrade the pylons and wires that bring electricity to consumers. Normally investors like putting their money into electricity because it offers reliable returns. Yet green energy has a dirty secret. The more it is deployed, the more it lowers the price of power from any source. That makes it hard to manage the tran-

sition to a carbon-free future, during which many generating technologies, clean and dirty, need to remain profitable if the lights are to stay on. Unless the market is fixed, subsidies to the industry will only grow.

Policymakers are already seeing this inconvenient truth as a reason to put the brakes on renewable energy. In parts of Europe and China, investment in renewables is slowing as subsidies are cut back. However, the solution is not less wind and solar. It is to rethink how the world prices clean energy in order to make better use of it.

Meanwhile, renewable energy demand among U.S. companies that are large utility customers is significant and growing quickly, according to a report from Advanced Energy Economy (AEE), a clean energy trade group. The [report](#) found that 71 of *Fortune* 100 companies have set renewable energy or sustainability targets, up from 60 just two years ago. Among *Fortune* 500 companies, commitments have held steady at 43 percent, or 215 firms, the report found. Twenty-two *Fortune* 500 companies have committed to sourcing 100 percent of their electricity needs from renewables, including **Wal-Mart Stores, Apple, General Motors** and **Amazon.com**. **Google** announced in December 2016 that 100 percent of its data centers around the world would be powered exclusively by renewable energy sources by 2017. However, companies with operations in states whose regulatory structures are not supportive of advanced energy must commit significant effort and creativity to meet these commitments.

Non-utility companies are entering the energy efficiency services market, particularly in deregulated markets. Google recently purchased Nest, which provides products and services to reduce residential electricity use. **Comcast** now provides an EcoSaver service to help customers save money on energy bills. **General Electric** has created a new company, Current, to focus on providing products and services in energy efficiency, renewable generation and storage to large buyers such as hospitals, universities, retail stores and cities. If this trend continues, utilities could be outpaced in providing a service in which they should be more expert than anyone.

According to PricewaterhouseCooper's [2015 Global Power & Utilities \(P&U\) Survey](#), 94 percent of electric power industry representatives predict that the power utility business model will be either completely transformed or significantly changed by 2030:

In defining future business models, utilities need to understand and challenge their company's purpose and positioning in tomorrow's markets. In the past, operating an integrated utility from generation through customer supply was well understood. Now, unbundling opportunities are extending deeper into the value chain and enabling greater participation by specialists. As a result, electric companies will need to rethink not just their roles and business models, but also their service and product offerings and approaches to customer engagement.

In May 2014, Barclays downgraded bonds for the entire U.S. electric utility sector due to risks posed by the rapidly declining costs of solar power and energy storage technologies. Deutsche Bank predicts total solar photovoltaic (PV) power costs would reach grid parity in 36 U.S. states as soon as this year, and Frost & Sullivan projects that both residential and utility-scale solar photovoltaic power will reach global grid parity by 2020. In many regions, wind and solar—especially at utility scale—are already reaching grid parity and often pricing out more traditional generation resources.

In 2016, Si2 published a report in collaboration with IRRIC Institute that examined in depth the climate orientation of the boards of the 25 largest investor-owned utilities, allowing investors to make informed judgements. [The Top 25 U.S. Electric Utilities: Climate Change, Corporate Governance and Politics](#) evaluated boards using a standardized set of metrics designed by Si2 with input from investors, governance experts and utility economists. The project provided data for use by investors concerned about climate

and regulatory impacts on their portfolio companies. Duke Energy was among the companies evaluated in that study.

This Action Report addresses carbon asset stranding, the 2-degree scenario and renewable energy and its relationship to climate change, which are discussed in greater detail in [Si2's 2017 Briefing Paper on Climate Change](#).

II. Duke Energy and Climate Change

Duke Energy is headquartered in Charlotte, North Carolina, and with its subsidiaries operates as an energy company in the United States and Latin America, through three segments: Electric Utilities and Infrastructure; Gas Utilities and Infrastructure; and Commercial Renewables.

Financials			
(\$ millions)	2016	2015	% Change
Operating Revenues	\$22,743	\$22,371	1.7%
Net Income	\$2,152	\$2,816	-23.6%
Source: Duke Energy			

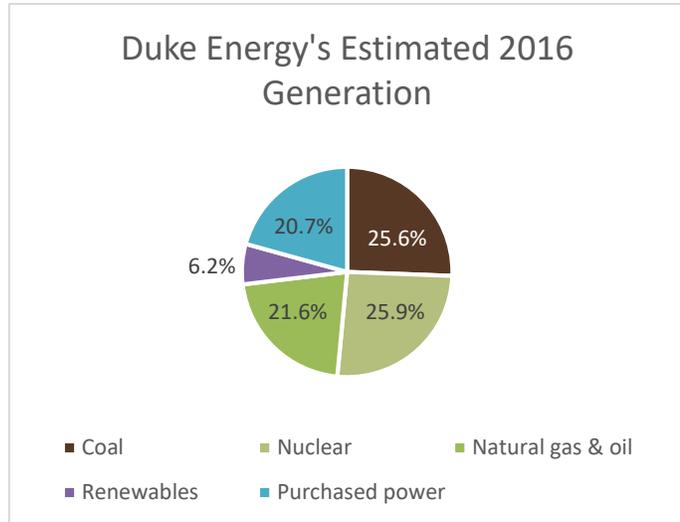
- Electric Utilities and Infrastructure** generates, transmits, distributes and sells electricity in the Carolinas, Florida, and the Midwest; uses coal, hydroelectric, natural gas, oil, renewable generation and nuclear fuel to generate electricity; and engages in the wholesale of electricity to municipalities, electric cooperative utilities and other load-serving entities. This segment serves approximately 7.5 million retail electric customers in six states in the Southeast and Midwest regions of the United States covering a service territory of approximately 95,000 square miles, and owns approximately 49,300 megawatts (MW) of generation capacity.
- Gas Utilities and Infrastructure** distributes natural gas to residential, commercial, industrial and power generation natural gas customers; it also owns, operates and invests in various pipeline transmission and natural gas storage facilities. It has approximately 1.5 million customers, including 1 million customers in North Carolina, South Carolina and Tennessee, and 529,000 customers southwestern Ohio and northern Kentucky.
- Commercial Renewables** acquires, builds, develops, and operates wind and solar renewable generation projects, including nonregulated renewable energy and energy storage services to utilities, electric cooperatives, municipalities, and commercial and industrial customers. This segment has 21 wind farms and 63 commercial solar farms with a capacity of 2,900 MW across 14 states.

Generation mix: Duke Energy reports its generation mix by segment, making it somewhat difficult to provide a picture of its operations as a whole. For 2016, the company's Electric Utilities and Infrastructure segment reported the following generation by source:

- Coal: 27.1%
- Nuclear: 27.4%
- Natural gas & oil: 22.9%
- Hydro & solar: 0.7%
- Purchased power & net interchange: 21.9%

The company's Gas Utilities and Infrastructure segment does not produce its own electricity, and does not report on the megawatt hours of gas that it handles. Duke Energy's Commercial Renewables segment does not break down its generation by fuel type, but has a generation capacity of roughly 2,900

MW. It is not ideal to combine generation capacity and actual generation in a calculation, but it allows a reasonable approximation of total generation, excluding the breakdown of purchased energy. The company's total generation capacity for 2016 was 52,200 MW, of which its Electric Utilities and Infrastructure segment accounted for 94.4 percent. In total, then, renewables accounted for approximately 6.2 percent of the company's 2016 generation, counting purchased power in the total but not breaking it down by source. The calculated split is shown in the pie chart on the right.



Climate Change Risk Management

According to Duke Energy's response to CDP's climate change survey, the highest level of direct responsibility for climate change within the company is at the senior manager/officer level. In its disclosure, the company discusses climate change as a legislative and regulatory matter, rather than as an operational, financial, environmental or social risk. Management says it views climate change as "one of the most significant issues facing the electric power industry," but this again is discussed in terms of an expectation of regulatory constraints. The company says it incorporates climate change risk into its decisions in planning for new power plants by "evaluating projects against a range of potential future prices on CO₂ emissions."

In its most recent Form 10-K filing with the Securities and Exchange Commission, Duke Energy briefly addresses climate change, largely describing the impact of various regulatory constraints. Management discloses the company's absolute carbon dioxide emissions for 2016 (discussed in greater detail later in this report), noting that its "future CO₂ emissions will be influenced by variables that include compliance with new or existing regulations, economic conditions that affect electricity demand and the technologies deployed to generate the electricity necessary to meet the customer demand." The remainder of the climate change section follows:

The Duke Energy Registrants have taken actions that have resulted in a reduction of CO₂ emissions over time. Actions have included the retirement of 47 coal-fired EGUs with a combined generating capacity of 5,425 MW. Much of that capacity has been replaced with state-of-the-art highly efficient natural gas-fired generation that produces far fewer CO₂ emissions per unit of electricity generated. Between 2005 and 2016, the Duke Energy Registrants have collectively lowered the CO₂ emissions from their electricity generation by approximately 30 percent, which lowers the exposure to any future mandatory CO₂ emission reduction requirements or carbon tax, whether as a result of federal legislation, the final CPP regulation or other as yet unknown emission reduction requirement. Under any future scenario involving mandatory CO₂ limitations, the Duke Energy Registrants would plan to seek recovery of their compliance costs through appropriate regulatory mechanisms.

The Duke Energy Registrants recognize **certain groups associate severe weather events with increasing levels of GHGs** in the atmosphere and forecast the possibility these weather events could have a material impact on future results of operations should they occur more frequently and with greater severity. However, the uncertain nature of potential changes in extreme weather events (such as increased frequency, duration and severity), the long period of time over which any potential changes might take place and the inability to predict potential changes with any degree of accuracy, make estimating any potential future financial risk to the Duke Energy Registrants' operations impossible. The Duke Energy Registrants have

historically planned and prepared for extreme weather events, such as ice storms, tornadoes, hurricanes, severe thunderstorms, high winds and droughts they occasionally experience. [emphasis added]

The Duke Energy Registrants routinely take steps to reduce the potential impact of severe weather events on their electric distribution systems. The Duke Energy Registrants' electric generating facilities are designed to withstand extreme weather events without significant damage. The Duke Energy Registrants maintain an inventory of coal and oil on-site to mitigate the effects of any potential short-term disruption in fuel supply so they can continue to provide customers with an uninterrupted supply of electricity.

The language above fails to acknowledge the established science of anthropogenic climate change, and its role in the proliferation of extreme weather events. In a June 2015 [interview](#) with *Utility Dive*, Robert Caldwell, Duke Energy's senior vice president for distributed resources, said, "Customers want more [renewables], whether they believe in greenhouse gas [impacts] or not. It's not really about the science — it's about making people feel good. So, we thought we've got to get into the space, and it makes sense."

Duke Energy notes in its 2016 10-K that the Paris climate agreement would seek to restrict average warming to 2 degrees Celsius, but also notes the current uncertainty that the United States will adhere to that agreement.

In Duke Energy's 2015 Sustainability Report (the most recent available), the term "climate change" appears twice: once in a general acknowledgement of "global efforts to stem climate change," and again in cautionary statements regarding forward-looking information. The subject is not addressed directly in any other part of the report.

The company similarly offers virtually no discussion of greenhouse gas emissions. The term appears twice in the sustainability report and once in a statement regarding its efforts to generate "cleaner" energy: "We are continuing our efforts to decrease greenhouse gas emissions in a way that preserves affordable rates and reliability. We are shifting our generation mix to more natural gas and renewable energy." The second instance is in a statement highlighting that one of Duke's nuclear plants delivers "greenhouse gas emissions-free power."

Emissions: Duke Energy is the [largest single emitter](#) in the United States of greenhouse gases. It is also the largest electric utility in the country. However, the company ranks 55th among U.S. electric utilities in terms of emissions intensity, according to a Ceres [report](#) benchmarking the air emissions of the U.S.' 100 largest power producers. According to that report:

Duke Energy has seen significant improvement in its SO₂ and NO_x emission rates since 2000. However, its CO₂ emissions have increased dramatically. After merging with Cinergy in 2006, Duke expanded its coal-fired generating feet, which led to a major increase in its CO₂ and SO₂ emissions. The company's SO₂ emissions dropped significantly after the merger as Duke completed scrubber retrofits at ten plants. The company's total generation has more than doubled between 2000 and 2013, including a nearly 60 percent increase from its merger with Progress Energy in 2012. As a result, Duke's CO₂ emissions have nearly tripled since 2000. Despite significantly higher CO₂ emissions, Duke's CO₂ emission rate has only risen 10 percent thanks in part to an increase in low and non-emitting generation.

Duke Energy sets targets for both absolute and relative emissions, which sets it apart from many of its peers. However, the company acknowledges that these targets are not science-based, and it does not intend to set science-based targets within the next two years. It aims to reduce absolute greenhouse gas emissions by 17 percent by 2020, relative to 2005. The company also has a goal to reduce its emissions intensity (metric tons of carbon dioxide equivalent per megawatt hour) by 23 percent by 2020, relative to 2005. While this is important progress, it falls well short of what would be required under a 2-degree scenario.

Low-carbon energy: Duke Energy Carolinas—the largest of Duke Energy’s utilities—filed its most recent long-term [Integrated Resource Plan](#) (IRP) in September 2016. Duke Energy sees slowing demand growth in the Carolinas, but its long-term outlook still finds a need for additional nuclear and natural gas, as well as expanding the amount of renewable power on its system.

In addition to pursuing a license for a new nuclear plant in South Carolina, the utility is working to complete three natural gas projects, including a combined cycle plant with a nameplate capacity³ above 650 MW. Two other plants with a combined capacity of roughly 1,700 MW are planned to come online in 2023 and 2025. Duke says in the IRP that it wants to boost solar energy resources on its system from 735 MW in 2017 to 2,168 MW in 2031, but the utility also made a point in its filing of highlighting renewable energy’s limitations:

While the company is aggressively pursuing solar as a renewable resource, the 2016 IRP recognizes and plans for its operational limitations. Solar energy is an intermittent renewable energy source that cannot be dispatched to meet changing customer demand during all hours of the day and night or through all types of weather.

The company anticipates that the percentage of Duke Energy Carolinas’ electric generation in winter from renewable energy, energy efficiency and demand-curbing programs will rise from 6 percent in 2017 to 12 percent in 2031, slightly more than Duke predicted a year ago.

Distributed energy systems: Duke Energy’s domestic utility operations all are in regulated jurisdictions. In the company’s discussion of competition in its most recent Form 10-K, Duke identifies the development and deployment of alternative energy sources as the primary source of competition in the regulated electric distribution business. Within this, Duke Energy highlights on-site generation and distributed generation as the primary components. Regarding the extent to which this may pose a threat to its business, Duke Energy says it “is not aware of any proposed legislation in any of its jurisdictions that would give its retail customers the right to choose their electricity provider or otherwise restructure or deregulate the electric industry including broadly subsidizing distributed generation such as rooftop solar.” The company notes in its risk section that if this situation were to change, it could result in customer loss and “stranded costs” related to excess generation for which costs would not be fully recoverable.

Separately, the company says that its Commercial Renewables unit has “executed investments to expand and grow the business through the addition of distributed solar projects, energy storage systems and energy management solutions specifically tailored to commercial businesses.” At present, distributed generation accounts for less than 0.1 percent of Duke Energy’s total generation capacity.

In 2013, Duke Energy invested \$42 million in Clean Power Finance, which provides financial services to the distributed solar industry. In 2015, Duke bought a majority stake in REC Solar, an additional move into the distributed energy space that should make it easier for commercial customers to go solar.

Executive pay packages and incentives: According to Duke Energy’s response to CDP’s climate change survey for 2015, the company provides no incentives for the management of climate change issues. According to the company’s 2016 proxy statement, Duke Energy’s executive compensation structure is determined in part by performance metrics, which include a measure of “renewables availability.” This is a renewable energy yield “calculated by comparing actual generation to expected generation based on

³ Nameplate capacity is the maximum rated output of a generator, prime mover or other electric power production equipment under specific conditions designated by the manufacturer.

the wind speed measured at the turbine and by calculating the actual generation to expected generation based on solar intensity measures at the panels. The renewables energy yield is weighted 90% to wind and 10% to solar.” The company does not disclose the precise weighting of this metric, although it is one of five elements of the “reliability” objective that is weighted at 20 percent.

Patterns of political spending and lobbying: Duke Energy’s response to CDP’s climate change survey for 2016 says the company is “committed to working with Congress and the White House to develop market-based approaches to reduce emissions that balance affordability for customers, protect the economies of our service territories, and provide reliable electricity to the 24+ million people that depend on us 24/7.”

[InfluenceMap](#) is an independent, United Kingdom-based, non-profit organization whose goal is “to accurately assess, rank and communicate the extent to which corporations are lobbying climate and energy policy worldwide.” The organization maps and analyzes large amounts of data on corporate and trade association lobbying, communications and spending, collected from a wide range of sources, and then assigns those organizations a grade ranging from an A+ to an F. Influence Map provides full sources for all of its assessments, with links to the original source for verification purposes. InfluenceMap assigns Duke Energy a score of E+ (an improvement from last year, when Duke’s score was an E-), summarizing the company’s score thus:

Duke Energy is negatively lobbying on a range [of] energy and climate change policy in the US. In its latest SEC 10-K filing (submitted Feb 2016) Duke Energy emphasised the uncertainty of the future impacts of climate change and the company has consistently suggested that concern for energy prices and energy security should weigh against the ambition of climate change policy. In 2014, Duke Energy opposed the US Clean Power Plan in consultation with the US policy makers. In 2016, the company has showed some positive engagement with state plans to comply with the plan. However, Duke Energy’s 2016 CDP Response shows ongoing opposition to the regulation and evidence suggests the company has been secretly funding legal action to derail the plan. Duke Energy supports ‘market-mechanisms’ to reduce GHG emissions and the company supports the use of emission trading in the implementation of the US Clean Power Plan. However, in consultation with US EPA in 2016, Duke Energy advocated for a number of provisions that may weaken the ambition of future schemes adopted as part of the plan. Despite continued support for renewable energy and energy efficiency standards in North Carolina in 2015, Duke Energy has in 2015 and 2016 also lobbied against a range of other renewable energy and energy efficiency legislative items, including schemes related to the Clean Power Plan and various state-level policies encouraging distributed renewable energy generation. Duke Energy has previously supported a high GHG energy mix in the US, although evidence from 2016 suggests increasing support for a transition from coal to gas. However, Duke Energy also appears to oppose the Clean Power Plan specifically due to its ambition of shifting power generation towards clean energy sources, and in 2016 criticised aspects of the plan as amounting to ‘wealth transfer’ from conventional electric generation to renewable energy sources. Despite in 2009 reportedly leaving the National Association of Manufacturers as a result of their opposition to climate change policy, Duke Energy remain members of multiple organizations actively opposing climate change legislation including Business Roundtable, the American Legislative Exchange Council and the Edison Electric Institute.

Stranded carbon asset risk: In a January 2016 report, “*Stranded Assets and Thermal Coal: An analysis of environment-related risk exposure*,” the University of Oxford’s Smith School of Enterprise and the Environment found that “the environment-related risks facing the thermal coal value chain are substantial and span physical environmental impacts, the transition risks of policy and technology responding to environmental pressures, and new legal liabilities that may arise from either of the former.” The report specifically evaluated the top 100 global utilities by coal-fired generation capacity for their risks related to asset stranding. The strongest takeaway from the researchers’ exhaustive analysis was that current disclosure mechanisms are not sufficient for consistent evaluation of stranded carbon asset risk. It said:

[I]t is noteworthy that very little of our analysis has actually depended on existing corporate reporting or data disclosed through voluntary disclosure frameworks. This is both a cause for hope and concern. It demonstrates that significant strides can be made to understand company exposure to environment-related risks even in the absence of consistent, comprehensive, and timely corporate reporting on these issues. But it also highlights how existing frameworks on environment-related corporate disclosure might be asking the wrong questions – they generally attempt to support and enable top down analysis, but might not do enough to support a bottom up, asset-specific approach. Reporting needs to link back to a fundamental understanding of risk and opportunity and to specific assets within company portfolios, especially for companies with portfolios of large physical assets (e.g. power stations, mines, oil and gas fields, processing plants, and factories). In the absence of that, what is reported may not be actionable from an investor perspective.

The researchers also note that the cost of accessing and processing the data they used for their study is prohibitive for most investors. The report ranked utilities' risk along a variety of scenarios associated with asset stranding:

- **Carbon Dioxide Intensity:** The more carbon-intensive a coal-fired power station, the more likely it is to be negatively affected by climate policy, whether through carbon pricing, emissions performance standards or similar measures.
- **Plant Age:** Older power stations create risk for utilities in two ways: they are more vulnerable to regulations that might force their closure, and they increase the likely cost of site remediation requirements.
- **Local Air Pollution:** Coal-fired power stations in locations with high population density and serious local air pollution are more at risk from regulation and emission abatement technology requirements, or even operation cessation.
- **Water Stress:** Power stations located in areas with higher physical baseline water stress, or in areas characterized by water conflict or regulatory uncertainty, are at higher risk of forced operational reduction or cessation, or of profit impairment by water pricing.
- **Coal Quality:** Coal-fired power stations that use lignite—which emits the most carbon dioxide of any coal type—are more at risk than those that use other forms of coal.
- **CCS Retrofitability:** Coal-fired power stations that are not suitable for carbon capture and storage (CCS) technology retrofit might be at greater risk of premature closure.
- **Future Heat Stress:** Climate change will exacerbate heat stress on power stations, as higher ambient local temperatures decrease power station efficiency and exacerbate water stress.

The following table (*next page*) shows the 12 major U.S. investor-owned utilities covered in the Oxford study, along with their risk ranking from 1 to 100, where 1 constitutes the lowest risk.

Board oversight: Unlike many of its peers, Duke Energy has a board member with discernable climate change expertise, although recent departures have reduced the climate change expertise of the board as a whole. One member, Dr. Richard Meserve, is president Emeritus of Carnegie Institute for Science, whose purview includes ecology and therefore climate change. Meserve also has 28 years of experience as an attorney focusing on environmental, scientific and energy issues at the law firm of Covington & Burling, LLP. Duke Energy specifically highlights Meserve's environmental and climate change expertise. Meserve also serves on PG&E's board of directors. Duke Energy also notes board member John H. Forsgren's prior management and financial experience as Vice Chairman and Chief Financial Officer of a large utility company, saying he has "extensive knowledge of the energy industry and insight on renewable energy," but does not elaborate further as to the basis for that insight.

Stranded Carbon Asset Risk Ranking								
Company	CO ₂ Intensity Risk Rank	Plant Age Risk Rank	Local Air Pollution Risk Rank	Water Stress Risk Rank	Coal Quality Risk Rank	CCS Retrofitability Risk Rank	Future Heat Stress Risk Rank	Average Risk Rank
AEP	65	87	20	1	62	100	83	59.7
NRG Energy	70	92	22	1	69	100	58	58.9
Ameren	74	96	26	1	1	100	100	56.9
DTE Energy	71	97	27	1	1	100	100	56.7
AES	64	71	31	62	1	100	32	51.6
Energy	52	72	11	1	1	100	100	48.1
Xcel Energy	40	59	5	73	1	100	54	47.4
Dominion Resources	57	94	24	1	1	100	33	44.3
Duke Energy	49	83	29	1	59	33	50	43.4
FirstEnergy	66	86	19	1	1	32	80	40.7
Southern	51	79	13	1	60	31	47	40.3
PPL	32	56	4	1	1	20	65	25.6

In the 2014 proxy voting season, two major Duke Energy investors urged shareholders to reject four board directors over the company's coal ash spill that same year. The California Public Employees' Retirement System and the New York City Pension Funds wrote fellow shareholders asking that they not re-elect four members of the Duke Energy board's regulatory policy and operations committee. The committee members – Alex Bernhardt, James Hylar, James Rhodes and Carlos Saladrigas – had oversight of Duke Energy's environmental, safety and health compliance. The letter cited the February 2, 2014, ash spill into the Dan River, saying Duke Energy had "forewarning of the public risk" from environmental groups that had intended to sue Duke Energy over ash contamination. None of the targeted committee members had coal industry or other relevant experience, CalPERS and New York City Comptroller Scott Stringer wrote.

Three of the targeted board members continue to serve on Duke Energy's board of directors. Bernhardt retired in 2015. While he does not have much in the way of environmental expertise, Bernhardt is a trustee of the North Carolina Chapter of The Nature Conservancy. Another board member from that period, former congressman Phil Sharp (D-Ind. 1983-95), departed at the end of 2014 as part of a planned retirement. Sharp has a strong background in environmental issues, and is the president of Resources for the Future, an environmental think tank. Sharp's environmental and climate change credentials are substantial. He was appointed to the National Academies' Committee on America's Climate Choices, and served from 2008 to 2011. During his long congressional tenure, Sharp took key leadership roles in the development of landmark energy legislation. He also helped to develop a critical part of the 1990 Clean Air Act Amendments, providing for a market-based emissions allowance trading system. Sharp's departure notably diminished Duke Energy's board-level climate competence. Duke Energy highlights the appointment to the board in 2015 of Dr. Meserve, who does have environmental and climate change expertise.

Jim Rogers, Duke Energy's CEO until his retirement in 2013, has become a prominent advocate for universal energy access. In a new book, *Lighting the World*, Rogers calls for new steps by governments, financial institutions and entrepreneurs to bring light to remote areas of the world. The book lays out a vision that eschews the traditional electrification approach of constructing large coal, gas and nuclear power plants, and promotes instead a reliance on local production, small-scale connections and alternative forms of energy, such as solar panels, the costs of which are coming down. Rogers has also emerged as a strong advocate for solar energy. Industry observers have speculated about the fact that Rogers' personal stance on our energy future appears to be more progressive and climate-aware than that of the company he left behind, leaving some to wonder if Rogers had been unable to steer Duke Energy fully in the direction he publicly espouses.

Climate change management incentives: The company seems to have taken a step back from a previously stronger position on climate change management incentives. Duke Energy's 2013 short-term incentive plan included an objective for all employees to encourage greater wind and solar generation, and for its staff responsible for end-use energy efficiency programs to promote customer adoption of the company's energy efficiency products and services. According to Duke Energy's most recent CDP response and proxy statement, the company has eliminated both incentives, and no longer provides any rewards for climate change management. Its most recent proxy statement only says that its management "may" grant performance awards based on "reportable environmental events," among myriad additional factors. This would appear to be strictly compliance-based.

Florida's Amendment 1 Campaign

On Election Day 2016, voters in Florida rejected Amendment 1, a controversial ballot measure that would have amended the state constitution to pave the way for more restrictions and fees for solar customers.

A utility-backed political committee called Consumers for Smart Solar was behind the campaign for Amendment 1, entitled "Rights of Electricity Consumers Regarding Solar Choice." Duke Energy was among the utilities supporting Consumers for Smart Solar, as was **Southern**. Amendment 1 was originally a defensive measure from utilities, intended to undermine a rival amendment that Floridians for Solar Choice—a bipartisan coalition of solar advocates—was proposing, which would have expanded rooftop solar availability by allowing homeowners and businesses to sell excess generation to third parties. That proposal did not make it to Florida's ballot, but the utilities continued their efforts to promote Amendment 1.

In March 2016, the Florida Supreme Court narrowly ruled 4-3 to allow the petition to appear on the November ballot. Justice Barbara Pariente, one of the three dissenting judges, wrote in her [dissent](#):

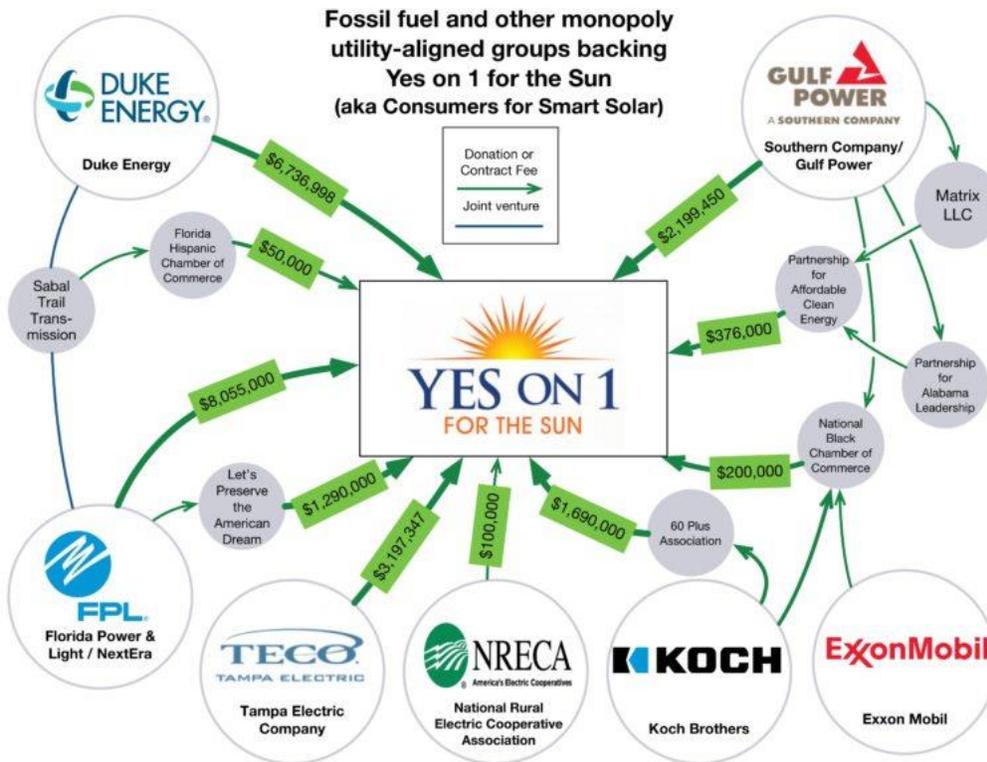
Let the pro-solar energy consumers beware. Masquerading as a pro-solar energy initiative, this proposed constitutional amendment, supported by some of Florida's major investor-owned electric utility companies, actually seeks to constitutionalize the status quo. The ballot title is affirmatively misleading by its focus on "Solar Energy Choice," when no real choice exists for those who favor expansion of solar energy. The ballot language is further defective for purporting to grant rights to solar energy consumers that are illusory; and failing, as required, to clearly and unambiguously set forth the chief purpose of the proposed amendment—to maintain the status quo favoring the very electric utilities who are the proponents of this amendment...

As I more fully explain, the biggest problem with the proposed amendment lies not with what the [ballot] summary says, but rather, with what it does not say... What the ballot summary does not say is that there

is already a right to use solar equipment for individual use afforded by the Florida Constitution and existing Florida statutes and regulations. It does not explain that the amendment will elevate the existing rights of the government to regulate solar energy use and establish that regulatory power as a constitutional right in Florida. This is a glaring omission, especially since rights enshrined in the Constitution are generally intended to limit, rather than grant, governmental power... This ballot initiative is the proverbial “wolf in sheep’s clothing.”

Voters rejected the amendment after Floridians for Solar Choice opposed the measure, and a series of eleventh-hour revelations called into question the proponents’ purported goal to expand solar generation.

Over the course of 14 months, the four large power companies in Florida—Duke Energy, **NextEra Energy’s** Florida Power & Light, **Southern Company’s** Gulf Power and **Tampa Electric Company**—along with organizations funded by these and other fossil fuel companies, **contributed** more than \$24 million to the Consumers for Smart Solar campaign. Only \$305 of the \$26.1 million total contributions came from individual donors. The following graphic shows the flow of money to the campaign.



Source: Energy and Policy Institute

Amendment 1 originally had appeared destined for easy passage. Consumers for Smart Solar promoted the amendment as protecting consumers and encouraging solar expansion, without explaining that the amendment would have paved the way for new fees and costs to rooftop solar users.

However, the situation began to shift in mid-October 2016, when leaked audio of a key Amendment 1 backer featured him acknowledging that the utilities had promoted the amendment as being pro-solar in an act of “political ju-jitsu.” He described the amendment as “an incredibly savvy maneuver” that

“would completely negate anything they [pro-solar interests] would try to do either legislatively or constitutionally down the road.” The story spread rapidly, and bolstered the opposition campaign. Florida’s Governor, Bob Graham, decried the proposal as “deceptive,” saying it would have accelerated the decline of solar power as an energy source in Florida.

Only days before Election Day, Florida’s professional firefighters’ union [withdrew](#) its support for Amendment 1, saying many of its members viewed it as deceptive, including in its portrayal of solar panels as a fire hazard. Ultimately, the amendment failed.

Duke Energy’s overall state [lobbying expenditures](#) in Florida grew nearly four-fold from \$75,000 in 2013 to nearly \$310,000 in 2015.

Political Influence in North Carolina

In a 2015 [report](#) on North Carolina political influence, the Institute for Southern Studies at the University of South Carolina found that Duke Energy was the number one special interest entity with political clout in the region. The company gave state-level candidates, party Political Action Campaigns (PACs) and an independent political spending group \$944,250 in 2012 and 2014. Duke Energy also donated \$100,000 to the North Carolina Chamber Independent Expenditure group, and is the second most influential lobbying interest in the state, according to the report.

Duke Energy’s [political influence](#) includes ties to top state officials, including former Governor Pat McCrory, a previous Duke employee. Former Duke Energy employee and current Majority Leader at the North Carolina House of Representatives, Mike Hager, is also Vice Chairman of the Public Utilities Committee, with authority over energy policy. In 2015, Hager told a group sponsored by Americans for Prosperity (funded by fossil fuel proponents Charles and David Koch) that he would continue to work to freeze North Carolina’s Renewable Portfolio Standard (RPS). Hager is the top recipient of campaign contributions from Duke Energy.

North Carolina, South Carolina, Florida and Kentucky all limit the use of third-party solar financing, resulting in Duke Energy’s virtual solar monopoly in these states. At least 98 percent of North Carolina’s 2,000 MW of solar is due to a [federal law](#), the Public Utility Regulatory Policies Act (PURPA), which Duke Energy has fought to limit. PURPA requires that utilities buy power produced by facilities that meet certain specified terms. In 2014 and 2015, Duke unsuccessfully fought to change the standard contract term and the formula for determining the avoided cost to which solar developers and other independent power producers are entitled. The North Carolina Utilities Commission rejected Duke’s proposals, which would have shortened the term of the power purchase agreements (PPAs), limited the size of systems eligible for PPAs and reduced remuneration to potentially uneconomic levels.

Duke Energy is again attempting to [revise](#) the PURPA bidding process, seeking anew to reduce contract lengths and trim project size, though not as drastically as in its previous attempts. This time around, though, the company has added a new element: It wants to be allowed to bid competitively to develop projects. A company spokesman said Duke’s main goal is to own more renewable energy. Duke Energy is likely to [take its proposal](#) to the North Carolina General Assembly for action this year.

After California, North Carolina is the second-leading state for installed solar capacity. The state’s position as a leading solar market has at times come with difficulties: Duke has reported a slate of utility-scale installations interfering with the system’s ability to provide power to retail load customers, as circuits are overloaded or the intermittent nature of solar causes instability. To avoid these problems, the

utility worked out an agreement with solar companies allowing their projects to move forward, while giving Duke the authority to disconnect them from the grid.

Ohio's Clean Energy Standards

In the United States, despite many attempts from fossil fuel companies, big utilities and conservative groups, no Renewable Portfolio Standard (RPS)⁴ put in place has ever been repealed. The closest any state has come was in 2014, when Governor John Kasich (R-Ohio) signed a law suspending the state's clean energy mandates for two years. Now that two-year suspension is up, but the Ohio legislature passed a bill in December 2016 that would make the RPS voluntary, effectively extending the suspension, for two more years. Kasich vetoed the measure, ending its suspension.

Ohio originally established its clean energy mandates in 2008 under a Republican legislature and a Democratic governor. The Alternative Energy Portfolio Standard requires Ohio's utilities to get 25 percent of their energy from "advanced" sources by 2025. Advanced sources include nuclear, so-called "clean coal" and combined heat and power.⁵ Half of that requirement—the 12.5 percent RPS—must come from renewable energy, and 0.5 percent specifically from solar. Half of the renewables must come from inside Ohio. Finally, the Energy Efficiency Resource Standard requires utilities to reduce demand by 22 percent by 2025 relative to 2009 levels.

Five years later, Ohio state senator Bill Seitz (R-Cincinnati) put forward a bill, SB 58, to do away with the state's RPS altogether. As of December 2016, Seitz sat on the board of directors of the American Legislative Exchange Council (ALEC), which has consistently and aggressively sought to roll back state clean energy policy. However, the RPS has enjoyed broad support among Ohioans, so the Republican leadership softened the bill to suspend the clean energy mandates, rather than abandoning them outright. The new bill, SB 310, established an Energy Mandates Study Committee (EMSC) in the Senate.

The EMSC launched an [investigation](#) that, by most accounts, was dramatically biased, focusing on the perceived drawbacks and costs of wind and solar with virtually no attention to their benefits. The EMSC's final [report](#) recommended indefinitely suspending the clean energy mandates. Kasich [described](#) the recommendation as "unacceptable" in September 2015.

In the second half of 2016, recognizing the risk of a veto, Ohio Republicans softened their stance, passing a bill that made the mandates voluntary for two years. For all intents and purposes, though, this would have had the same impact as a suspension. In addition to freezing the 2016 targets until 2018, the bill also sought to eliminate the "advanced energy" part of the mandates, push all deadlines back two years, and remove the in-state requirements on the RPS. In late December 2016, Kasich [vetoed](#) the bill, effectively reinstating the renewable energy and efficiency standards.

Three utilities—Duke Energy, **FirstEnergy** and **American Electric Power**—have actively [lobbied](#) to weaken Ohio's clean energy standards. The Energy and Policy Institute, a watchdog group, filed public

⁴ A renewable portfolio standard (RPS) is a regulatory mandate to increase production of energy from renewable sources such as wind, solar, biomass and other alternatives to fossil and nuclear electric generation.

⁵ Combined heat and power (CHP) systems, also known as cogeneration, generate electricity and useful thermal energy in a single, integrated system. CHP is not a technology, but an approach to applying technologies. Heat that is normally wasted in conventional power generation is recovered as useful energy, which prevents the losses that would otherwise be incurred from separate generation of heat and power. While the conventional method of producing usable heat and power separately has a typical combined efficiency of 45 percent, CHP systems can operate at levels as high as 80 percent. CHP typically still relies on fossil fuels.

information requests for emails from state legislators during the development of the bill, and uncovered significant influence of the utilities over legislators, particularly Seitz.

One month before the EMSC report was published, Seitz emailed some fellow Republican legislators and 10 utility and fossil fuel lobbyists (including those representing Duke Energy, FirstEnergy and American Electric Power), saying, “we should be meeting as a small group to figure out what that report is going to say.” He also emailed lobbyists earlier, asking, “which portions of [a Michigan bill to repeal that state’s RPS] we should emulate.”

The emails also show that Ryan Gentil, a Duke Energy lobbyist, was scheduled to meet with Senator Troy Balderson, co-chair of the EMSC, a little more than two weeks before the committee’s final report was released. Gentil requested the meeting with Senator Balderson “to discuss with him Duke’s position on the EMSC.” Seitz also solicited lobbyist feedback on a report outlining the financial benefit of Ohio’s energy efficiency standards. This report was ultimately excluded from the EMSC’s report. Another email shows Seitz denying that carbon dioxide is a factor in “clean air.”

The emails also show that a Duke Energy lobbyist reached out to several Ohio state legislators on June 30, 2015, to request a meeting about the evolving push to reregulate Ohio’s electricity markets. Reregulation would allow Duke to return to a vertically integrated model in the state, gutting competition at the generation level.

Two Carolinas and Third-Party Ownership

Duke has been involved in debates around third-party ownership (TPO) of rooftop solar that provides investors insight into how it might capitalize on growth opportunities. In states where it is permitted by regulators, TPO arrangements allow customers to lease solar panels from a financier over many years instead of owning them outright. For many consumers, this option has significantly boosted the solar value proposition because they can avoid high up-front costs and enjoy cost savings. Duke Energy’s involvement in and experience with the TPO debate in North Carolina versus South Carolina has been decidedly different, highlighting the importance of stakeholder collaboration in policy design.

In 2015, Duke Energy came to a settlement with solar advocates and environmentalists in South Carolina to legalize TPO, but opposed a similar bill in its home state of North Carolina. Since Duke’s unregulated renewables subsidiary takes advantage of TPO opportunities in other states, this has led some environmentalists and solar advocates to assert that the company is trying to limit the growth of solar in its own service territory. Duke counters that the situation in the two states is drastically different. In South Carolina, while customers may finance and buy panels from a third-party provider, only Duke can sell electricity directly. If a customer has generated excess power that it wants to sell back to the grid, it must go through Duke Energy. North Carolina’s proposition would allow other companies, such as renewables developers, to bypass the utility and sell directly to their consumers.

Renewables advocates say that clean energy could grow even faster if direct sales of electricity were allowed from third parties. The idea is that competition could push utilities either to use more renewables or to reduce their prices if vendors can undercut utility prices. Duke’s position is that anyone trying to sell electricity on the company’s grid needs to pay for it, and third-party providers will not pay their share for grid upkeep if they sell power directly to customers.

In the North Carolina debate, Duke has repeatedly said that instead of tackling TPO in an individual bill, it prefers to craft comprehensive electricity policy legislation with all the relevant stakeholders at the table, as it did in South Carolina. Solar advocates argue that the two states have significantly different

solar markets, and that North Carolina's is sufficiently advanced that it does not need Duke's support, as South Carolina still does.

Duke Energy had been embroiled in recent years in a [regulatory test case](#), brought by environmental advocacy group NC WARN, which had filed an application to sell power directly to a church from a rooftop solar array, bypassing the utility. Duke Energy and NC WARN have a long-standing, antagonistic relationship. The North Carolina Utilities Commission rejected the test case in April 2016, fining NC WARN \$60,000 for illegally acting as an electricity provider.

In South Carolina, Duke Energy nominated the Electric Cooperatives of South Carolina and Central Electric Power Cooperative for the Electric Cooperative Solar Power Player award, in recognition of the cooperatives' work on the state's solar settlement. Duke's nomination [said](#) that co-op leaders "effectively changed the conversation in South Carolina from one that was very adversarial and positional, to a conversation about 'what we are interested in doing' and 'a shared vision' for the future." During the legislative vote on Act 236, when the list of endorsers was read on the South Carolina House floor by the Chair of the sponsoring committee, he said it was "highly unusual for those endorsers to even be in the same room..."

The coalition of environmentalists, solar advocates, utilities and electric cooperatives had already agreed on Act 236 before it went to the legislature. That meant the politicians had no votes or campaign contributions to lose in supporting it. The bill also required that South Carolina Electric & Gas and Duke Energy Carolinas commit to minimum amounts of renewables, but it allotted the renewables in various sizes. That gave both sides something. The utilities liked the opportunity in utility-scale projects, and private sector developers saw opportunity in smaller projects.

Industry and Investor Initiatives

Climate risk analysis and disclosure: On December 14, 2016, a 20-nation task force released [guidelines](#) for voluntary climate risk disclosure by companies and investors in financial filings. The Task Force on Climate-Related Financial Disclosures (TCFD), set up by Bank of England Governor Mark Carney in his role as head of the G20's Financial Stability Board, recommends that all companies "describe the potential impact of different scenarios, including a 2°C scenario, on the organization's businesses, strategy, and financial planning," and provides more specific guidance for companies in the oil and gas, coal and electric utilities sectors due to the unique vulnerabilities of these industries. The TCFD offered 11 specific recommendations for all industries, divided into four topics: governance, strategy, risk management and metrics and targets. They include:

- All companies should benchmark strategic and financial planning using a 2-degrees Celsius economic scenario as their baseline for analyzing climate risks and opportunities. (As discussed earlier in this report, even two degrees Celsius of average global temperature increase could be too much to prevent catastrophic impacts.)
- All companies should disclose information related to water, energy usage and efficiency, land use and revenues from products and services designed for a low carbon economy.

Duke Energy's peers **NRG Energy**, **Xcel** and **Enel** (in Italy) have set greenhouse gas emission targets aligned with achieving a 2-degree scenario. **BHP Billiton**, a global mining, metals and petroleum company, has adopted a [planning process](#) that "uses scenario analysis to encompass a wide spectrum of potential outcomes for key global uncertainties." In a 2015 [report](#), BHP Billiton outlined four possible scenarios ranging from an orderly transition to a 2-degree world to a shock event that leads to a much more rapid transition to a 2-degree Celsius world by 2030.

Shareholder Support for Item 7

On March 27, 2017, the California Public Employees' Retirement System (CalPERS) announced that it would vote in favor of this proposal and encouraged other shareholders to follow suit. CalPERS is the largest state public pension fund in the United States with \$311 billion in total assets under management, and owns approximately 2,381,000 shares in Duke Energy. CalPERS explained its reasoning in an [SEC filing](#):

After completing a review of the CalPERS global equity portfolio, we identified 100 companies as significant carbon emitters responsible for over 50% of the portfolio's total carbon emissions. CalPERS defines these companies as systemically important carbon emitters (SICEs) – with Duke Energy Corp. being one of them. Further, we believe proposal #7 is of particular significance in light of the global consensus regarding climate change and emission reduction targets reflected in the Paris Agreement. The importance of the proposal's request is also underscored by the efforts of Financial Stability Board (FSB), an international body mandated by G-20 leaders to develop efficient climate-related financial risk disclosures.

Consistent with the CalPERS Investment Beliefs, we believe effective management of environmental factors, including those related to climate change risk increase the likelihood that companies will perform well over the long-term.

Coal Ash

Coal combustion results in coal waste—called coal ash—that is laced with heavy metals such as arsenic, mercury and lead, as well as other toxins that can contaminate water and raise cancer risk with long-term exposure. The U.S. Commission on Civil Rights published a [study](#) in September 2016 that said the EPA systematically delays responding to Title VI civil rights complaints on environmental hazards, and cannot provide adequate relief when it does. The Commission said the EPA has failed to comply with a Clinton-era executive order governing environmental justice by not addressing impacts of coal ash waste disposal in predominantly minority, low-income communities. The report specifically called out Duke Energy over some recent, high-profile coal ash contamination incidents, recommending that the North Carolina Department of Environmental Quality change the risk classification for coal ash ponds from low to high.

On February 2, 2014, a metal pipe in a Duke Energy coal ash pond burst open and leaked an estimated 82,000 tons of coal ash and 24 million gallons of contaminated water into the Dan River in North Carolina. For a week, heavy metals such as arsenic, selenium, chromium, and mercury spilled into the river. According to news reports, coal ash was found as far as 70 to 80 miles downstream coating the bottom of the river, and in some locations, the coating was as much as 5 feet deep.

The spill occurred in the context of several investigations and lawsuits regarding Duke Energy's coal ash sites throughout North Carolina, and the severity of the spill brought greater attention to the environmental hazard that exists throughout the state. In 2009 the EPA had made multiple suggestions to Duke Energy to monitor its sites in North Carolina, and in 2010 the EPA listed the Dan River and 11 other coal ash ponds in North Carolina as "high hazard," meaning there was a potential for loss of life and economic catastrophe.

After the February 2014 spill, Duke Energy subsidiaries pled guilty to nine charges of Clean Water Act violations, and agreed to pay \$68 million in fines and spend \$34 million on environmental projects and land conservation. Additionally, Duke Energy entered into a \$3 million cleanup agreement with the EPA. However, some organizations estimate the total cleanup cost could ultimately add up to as much as \$300 million.

Following the Dan River spill, public scrutiny of coal ash pond enforcement has increased. There are four unlined coal ash waste ponds designated by the EPA as high hazard on the banks of the Catawba-Waterere River, and a dozen other coal ash basins that the agency says pose severe threats to drinking water. Walnut Cove is the location of one such ash pond, belonging to Duke Energy. The pond is 380 acres in size and 12 stories deep. The groundwater contamination from the unlined basin has allegedly caused decades of health crises in the area, according to residents of the area. Appalachian Voices, an environmental advocacy non-profit, contends that Duke's ash pond in Walnut Cove holds 20 times the amount of ash that the Dan River site contained, and is held back by a dam that the EPA has deemed at risk of killing residents if it were to fail.

People of color make up 74 percent of the affected community surrounding Duke Energy's Walnut Cove ash pond. The low-income population of Walnut Cove is 1.5 times higher than the national average, and the percentage of residents with less than a high school education exceeds the state and federal average. Water contamination has led to dramatic devaluation of local property, and threatens local food production. The community surrounding Walnut Cove suffers from disproportionately high rates of rare forms of leukemia, respiratory illnesses, neurological problems, learning disabilities, heart attacks and early-age strokes. According to court testimony by Duke Energy representatives, the company's own research has found evidence of significant groundwater contamination. Additional court testimony reveals that Walnut Grove residents suspect collusion between Duke Energy and state regulators. A regulatory loophole classifies Duke's Walnut Cove ash pond as mine reclamation rather than landfill, thereby exempting the company from coal ash regulation.

Duke Energy says it adheres to industry standards on managing coal ash. In the past, the company stored coal ash in basins, but is now moving to store it in dry and lined landfills. The company says it has reused 38 percent of the ash that it produced in North Carolina. After the Dan River spill, Duke Energy accelerated its coal ash basin closures in advance of anticipated federal regulation.

In August 2016, North Carolina's toxicologist alleged in a deposition for a lawsuit against Duke Energy that tests of the water inside wells near the utility's coal ash ponds showed [high levels of toxic chemicals](#), and the state and utility had both failed to inform citizens. Still, Duke Energy maintains that water near its sites is safe to drink, with chief of staff Thomas Stith saying "homeowners near coal ash ponds" possessed "all facts and safety information about their drinking water."

In response to the Commission report, Duke representative Sean Walsh told [NC Policy Watch](#) that there is no evidence the utility's activities are adversely affecting neighbors' water or health. He said the utility will comply with required state law by providing permanent alternative water resources to populations within a half-mile of coal ash disposal sites by October 2018.

Duke Energy says it plans to close all of its North Carolina ash basins by 2029. The company discloses its costs associated with legal action and compliance with coal ash regulation in its 2016 Form 10-K. Duke Energy has estimated its liability for cleanup and storage efforts at about \$4.2 billion. The utility had spent more than \$725 million as of November 2016. In March 2017, Duke Energy [filed lawsuits](#) against 30 international and domestic insurance companies, saying they should cover part of the utility's coal ash cleanup costs in the Carolinas. Further, the utility intends to ask North Carolina regulators for rate increases that will include cleanup costs that it will pass on to its customers. Duke Energy says any money recovered from insurers would offset the increase in customer charges.

Duke Energy maintains a section of its website on [ash management](#), although much of this is geared toward characterizing coal ash as safe. It does not address disproportional impacts on disadvantaged communities.

III. Proponent Position

Item 7 (Report on climate change strategy)

The proponent, the New York State Common Retirement Fund (NYSCRF), believes that traditional electric utility business models are at risk from the growth of customer-sited distributed generation and global climate change. The rapidly decreasing cost of solar photovoltaic (PV) and battery storage technology is prompting customers to switch to solar power providers for a portion of their energy needs, or leave the grid entirely (using batteries and or other backup systems), as the proponent points out in a [memo](#) supporting the resolution. As a result, utilities may need to raise prices for remaining customers to recoup their long-term investments and cover grid maintenance, prompting additional customers to switch to solar.

The proponent notes that the Moody's credit rating agency now analyzes carbon transition risk, and highlights the high carbon risk exposure of the power sector. NYSCRF also points out that, according to the International Energy Agency (IEA), transportation [accounts](#) for more than one-fifth of global carbon dioxide emissions and is likely to rise, [requiring rapid adoption](#) of new technologies to keep temperatures within the 2-degree Celsius limit set by the Paris Agreement. The IEA and the International Council on Clean Transportation [forecast](#) that transport electrification will play a critical role in achieving required greenhouse gas reductions by 2050. The proponent raises this issue as an example of a disruptive force in the energy space.

NYSCRF says that Duke Energy does not provide sufficient information on its long-term strategy to decarbonize, and that it is concerned the company is “not properly accounting for the risk of its current high reliance on carbon-intensive generation and is still planning future investments in fossil fuel-based generation.” NYSCRF believes that a 2-degree analysis will provide investors with “a more complete picture of current and future risks and opportunities than business as usual planning,” and that an analysis that projects to 2040 will help the company plan better for “future regulatory, technological and market changes.”

The proponent suggests that the requested report could include a discussion of how the company would adjust its capital expenditure plans to a 2-degree scenario, along with “plans to integrate technological, regulatory and business model innovations such as electric vehicle infrastructure, distributed energy sources (storage and generation), demand response, smart grid technologies, and customer energy efficiency as well as corresponding revenue models and rate designs.”

Item 8 (Report on coal ash risks)

The proponent is concerned about the harms coal use produces to public health, specifically as regards water contamination, air quality, climate change and the disproportionate impact on communities of color. As You Sow points to Duke Energy's Dan River spill, saying this had incurred “brand damage, environmental and water impacts, and millions of dollars in clean-up costs.” (In fact, clean-up costs are now in the billions.) The proponent raises the U.S. Civil Rights Commission's report implicating coal ash in general and Duke Energy specifically in disproportionate impacts on communities of color, highlighting the multiple adverse health effects of coal combustion's emissions to air and water.

The proponent is also concerned about coal's contribution to climate change, as well as its susceptibility to climate change risks. Specifically, As You Sow notes the threat that climate-induced extreme weather events pose to “the reliability and safety of coal ash infrastructure,” pointing out that one of Duke's spills occurred in the wake of flooding induced by Hurricane Matthew.

As You Sow is concerned about Duke Energy's sustained, high use of coal despite the above risks. The proponent requests a report “assessing the public health impacts of its coal use on rates of illness, mortality, and infant death, due to coal related air and water pollution in communities adjacent to Duke's

coal operations, and seeks a financial analysis on the cost Duke Energy sustains from coal-related public health impacts, “including potential liability and reputational damage.” The proponent further requests that this report consider specific impacts on communities of color, in line with the U.S. Civil Rights Commission’s findings.

IV. Management Position

Item 7 (Report on climate change strategy)

Duke Energy’s board of directors opposes the resolution, saying the company “takes seriously its responsibility to provide reliable, affordable and clean power for all of its customers and is committed to a cleaner, smarter energy future by finding new ways to improve energy efficiency and reduce air emissions.” Management points to the company’s emissions reduction progress, portfolio diversification and coal plan retirement efforts, as described earlier in this report. The board points out that while it is the largest electric utility in the United States, it ranks 55th in emissions intensity, setting it apart from its peers.

Management also argues that Duke Energy is subject to extensive regulation, including as relates to resource planning, and that its compliance efforts address “many of the concerns contained in the proposal.” It says it is already planning for near- and long-term carbon constraints using a scenario-planning approach. The board says it already provides much of the information the proponent requests in its various publicly available documents.

In summary, the Board of Directors does not believe it is in the best interests of the Corporation or its shareholders to prepare such a report at this time due to Duke Energy’s efforts relating to carbon dioxide emissions reduction, its resource planning process which considers varying stringencies of future carbon constraints, and the Corporation’s extensive disclosure included in various public reports of emissions data, emission reduction results, investments, and significant policy engagement. Developing a separate report as requested in the proposal would be an inefficient use of Corporation resources and will not add value to the Corporation’s current efforts in this area.

The board does not mention climate change or its risks in its opposing statement.

Item 8 (Report on coal ash risks)

Management says that Duke Energy “is committed to finding new ways to confront our industry’s biggest challenges, including greenhouse gas emissions and other issues associated with the use of coal as a fuel source for electric generation.” The board says it has a risk management process in place to take account of these issues, and has been taking steps to mitigate them. It says the company regularly reports on these efforts in its public disclosures:

The Corporation has invested more than \$7.5 billion in environmental control equipment to lower emissions from its power plants since 1999 and has decreased carbon dioxide emissions by 28%, sulfur dioxide emissions by 86% and nitrogen oxide emissions by 65% since 2005. The Corporation has also announced plans to retire more than 1,800 megawatts of coal generation and invest \$4 billion in new, efficient natural gas facilities by 2020. In addition to its investments to modernize its generation fleet to reduce emissions, the Corporation has also made substantial investments in renewable energy, including investing almost \$5 billion to grow its wind and solar power businesses with plans to invest approximately \$3 billion more in renewables by 2020.

Management asserts that Duke Energy is an industry leader in coal ash management, highlighting its plans to close its North Carolina ash basins by 2029. It goes on to details the various public disclosures it offers, as discussed earlier in this report. For these reasons, the board opposes the resolution, saying that the requested report would be duplicative and a waste of resources.

The board does not address the question of disproportionate impacts on communities of color that was broached by the proponent.

V. Analysis

Key Point at Issue

- Is Duke Energy sufficiently reporting on how it is positioning the company in response to climate change constraints?
- Is Duke Energy adequately addressing the issues related to coal ash pollution, particularly as regards communities of color?

For additional analysis, please refer to Si2's 2017 [Briefing Paper - Environment \(Climate Change\)](#). The following analysis is specific to Duke Energy.

Duke Energy is the biggest electric utility in the United States, and the country's single heaviest greenhouse gas emitter in absolute terms. The utility is significantly dependent on coal, although its dependence has lessened in recent years. It is working to retire some of its coal-fired generation and to increase its use of natural gas-fired generation and renewables. Duke's greenhouse gas emissions intensity ranks 55th among electric utilities, placing it well ahead of its peers, but remains far in excess of what would be necessary in a 2-degree scenario. While it sets absolute and relative emissions targets, these are not science-based, and Duke Energy says it does not intend to set science-based targets within the next two years.

The New York State Common Retirement Fund (NYSCRF), proponent of item 7, which asks for a report on policies that would limit the effects of global warming to no more than 2 degrees Celsius, raises concerns about growing evidence that anthropogenic climate change is already having serious impacts on the environment and society, that these impacts are highly likely to increase in severity and that global regulatory bodies will take increasingly stringent steps to constrain the greenhouse gas emissions that are responsible for the majority of atmospheric warming. NYSCRF specifically raises the 2-degree scenario, which reflects what had been a general scientific consensus that average global temperatures must not increase more than 2 degrees Celsius in order for catastrophic impacts to be averted. Recent research, however, strongly suggests that even 2 degrees of warming would be devastating, and the most recent discourse is turning toward a 1.5-degree scenario. Within this context, NYSCRF wants to know more about how Duke Energy is planning for a transition to this new, low-carbon future.

The Paris climate treaty reached in December 2015 initially prompted optimism from many about new prospects for a real shift in global government action to address climate change. The outcome of the 2016 presidential election and the new Trump administration's stated intention to abandon many of the U.S. existing climate initiatives may delay some movement at the federal level. Nonetheless, many large institutional investors are convinced that companies and governments must take urgent action to address climate risks; they are paying ever closer attention to how their portfolio companies are strategically situated to handle climate-related risks and opportunities, despite the continuing U.S. political dysfunction that puts meaningful national energy legislation out of reach in the short term. Many analysts believe that regulation is inevitable, given the scope and impact of the problem, and that if such regulation is delayed, it will constitute a greater shock when it is ultimately passed. They argue that companies would create a strategic advantage by adjusting their business models now. Indeed, many leading global asset managers are now advocating for greater climate change risk management and disclosure, and do not believe that a temporary shift in U.S. policy will derail decarbonization efforts. Furthermore, states may step up climate change mitigation efforts in the face of federal inaction.

Some utility peers and other energy companies are providing the type of information suggested by the proponent, or outlooks with the suggested timeframe; **NRG Energy, Xcel** and **Enel**, for instance, have set greenhouse gas emission targets aligned with achieving a 2-degree scenario, while **ConocoPhillips, Statoil** and **BHP Billiton** have conducted 2-degree scenario analyses through 2040. While other utilities faced with the same proposal this year argue that they are not in a position to make projections about regulatory and societal developments out to 2040, Duke Energy does not discuss this, instead simply saying that it already substantially complies with the essence of the proposal. However, the company provides very little discussion of non-regulatory climate change risk.

Duke's response to the resolution does not provide the company's view on any potential threats to its business model, but it does point out that renewables are a growing part of its generating mix and that through publicly available reports, it keeps its shareholders and stakeholders informed of the company's approach and commitment to renewable energy. At present, though, renewables make up a very small proportion of its business. Furthermore, the company has been very active in obstructing climate regulation and renewable proliferation that does not fit its existing interests and business model. Investors will need to weigh whether the company's apparently protective stance is in its best long-term interests.

Regarding coal ash risks, the subject of item 8, Duke Energy faces substantial liability from its contamination incidents, so much so that it is passing costs on to customers and suing insurers in an attempt at cost recovery. The company notes its intent to close its North Carolina ash ponds by 2029, but that remains a dozen years away and does not address ash ponds it may have in other areas. The company does not comment on the serious issues raised by the U.S. Commission on Civil Rights with respect to disproportionate impacts on communities of color. Shareholders will need to evaluate whether the company is providing a sufficiently robust response to these matters.

Voting Considerations

Item 7 (Report on climate change strategy)

Voting in favor: Investors who share the proponent's view that the company should provide more information on potential impacts driven by a 2-degree scenario will vote in favor of the resolution. They are likely to believe that this report would help investors better assess risks and potentially help the company prepare for likely climate-induced risks. These shareholders are also likely to believe that even though the United States has retreated from climate change initiatives under a new administration, the growing risk and impact of climate change renders eventual regulation inevitable, and companies would serve their shareholders' interests by preparing and adapting now.

Voting against: Shareholders who believe the company's current disclosure is adequate will probably vote against the resolution. These investors may be persuaded that the United States' recent retreat from climate-related regulation decreases the likelihood of regulatory pressure on carbon-intensive companies. Shareholders voting against this proposal may further be persuaded by the company's assertions that it is transitioning its energy sources to a cleaner, lower-emitting mix. They may further be persuaded that Duke Energy's low emissions intensity relative to its absolute emissions demonstrates the company's commitment to managing its climate change impacts.

Item 8 (Report on coal ash risks)

Voting in favor: Those who share the proponent's concern that Duke Energy's disclosure on coal ash management and impacts is not sufficient to evaluate risk are likely to support the resolution. These investors are likely to be concerned about the substantial liability to which the company is exposed, as well as its efforts to pass these on to ratepayers. Supporters of this proposal are also likely to be concerned

about the strong allegations contained in the U.S. Commission on Civil Rights' report, and Duke Energy's choice not to address specifically the issues related to communities of color.

Voting against: Investors who think the company has already released adequate information on its coal ash management are likely to vote against this proposal. These shareholders are likely to believe that the company's plans to shut its North Carolina ash ponds by 2029 are sufficient. Opposing investors may further believe that disproportionate impacts on communities of color from coal ash pollution do not constitute sufficient cause for additional attention from management.

Resources

- Duke Energy's 2017 Proxy Statement
<https://www.sec.gov/Archives/edgar/data/1326160/000104746917001925/a2231352zdef14a.htm>
- Duke Energy's 2016 Form 10-K
<https://www.sec.gov/Archives/edgar/data/17797/000132616017000016/duk-20161231x10k.htm>
- Duke Energy 2015 Sustainability Report
<http://sustainabilityreport.duke-energy.com/>
- Duke Energy's 2016 response to CDP's climate change survey
https://www.duke-energy.com/_/media/pdfs/our-company/duke-2016-cdp-response.pdf
- *The Top 25 U.S. Electric Utilities: Climate Change, Corporate Governance and Politics*
<http://irrcinstitute.org/reports/the-top-25-u-s-electric-utilities-climate-change-corporate-governance-and-politics/>