Sustainable Investments Institute

Action Report

Environment (Climate Change)/Board Oversight

Dominion Resources

April 18, 2017

S+Ticker	Exchange	Meeting Date	Record Date	Annual Meeting Location
D	NYSE	5-10-17	3-3-17	Glen Allen, Virginia

Agenda	
Item	**Proposal**
1	MGT: Elect directors
2	MGT: Ratify selection of auditor
3	MGT: Advisory vote on executive compensation
4	MGT: Advisory vote on frequency of executive compensation vote
5	SH: Approve name change
6	SH: Report on lobbying
7	**SH: Nominate environmental expert to board**
8	**SH: Report on climate change strategy**
9	**SH: Report on methane emissions/reduction targets**

Si2 Briefings Environment (Climate Change) and Environmental Management

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Links 2017 Proxy Statement, 2016 Form 10-K

Vote History

This is the seventh year that a group of individuals has filed resolutions at Dominion with help from the Sierra Club. They filed four resolutions for 2017; three are coming to a vote (Items 7, 8 and 9), and one was omitted. (Another proposal, Item 6, on lobbying, is covered in a separate Si2 report.) Item 7 was filed separately from the Sierra Club group. Two of these resolutions are resubmissions:

- A proposal similar to Item 7, nominate environmental expert to board, earned 19.1 percent in 2015.
- A proposal related to Item 8, report on climate change strategy, earned 20 percent in 2014, 5.8 percent in 2015 and 21.3 percent in 2016. That proposal had asked the company to set greenhouse gas reduction targets. Another related proposal, asking the company to report on its energy efficiency and renewables programs, earned 21.6 percent support in 2014 and 22.0 percent in 2015.

Item 9 did not come up in 2016, though there is an earlier history of similar proposals at the company. A proposal on methane at Dominion last year was omitted after the company successfully argued it was moot since it had provided a detailed report. The company's challenge this year at the SEC was not successful, however. Earlier methane proposals at the company earned 25 percent in 2015 and 21.9 percent in 2014. As You Sow was a co-filer.

Item 7	
Resolved Clause	Resolved: Shareholders request that as elected board directors' terms of office expire, at least one expert independent director* is recommended for Board Election satisfying the described criteria. *A director is "independent" if, during the preceding three years, he or she was NOT • affiliated with a company that was an advisor or consultant to Dominion; • employed by or had personal service contract(s) with Dominion or its senior management; affiliated with a company or non-profit entity that received the greater of $2 million or 2% of its gross annual revenues from Dominion; • in a business relationship with Dominion worth at least $100,000 annually; • employed by a public company at which an executive officer of Dominion serves as a director; • in a relationship of the sorts described herein with any affiliate of Dominion; and • a spouse, parent, child, sibling or in-law of any person described above.
Lead Proponent	Joy Loving
Summary	The proponent says that environmental expertise is critical to Dominion's success, given the high-impact nature of electric utilities. She asserts that climate change and environmental management are critical to Dominion's success, and must be part of its strategic planning. The proponent believes that nominating an environmental/climate change expert to the board of directors is an important step in managing Dominion's environmental impacts. Management responds that its existing board nomination process is effective, and that it is not in shareholders' best interest to require a particular type of specialist. The board asserts that its fiduciary duties are not limited to any single issue, and that the proposal's request is unreasonably confining. Management says it receives regular updates on environmental matters from internal and external sources, and that its track record of emissions reduction demonstrates its effective environmental management.
Item 8	
Resolved Clause	Resolved: Shareholders request that Dominion Resources, 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 (NYSCRF)
Summary	NYSCRF believes Dominion has not adequately responded to the growing risk utilities face from shifting technologies in response to climate change pressures. Given what it considers to be the increasing likelihood of material impact resulting from efforts to constrain greenhouse gas emissions, the proponent maintains that assessing the company's portfolio risks in keeping with a 2-degree scenario could help Dominion to continue its leadership on environmental efforts and align with a growing global trend. Management counters that it already files annual Integrated Resource Plans (IRP) in keeping with Virginia law, and a similar plan every two years in compliance with North Carolina law. The board of directors asserts that it already has an integrated strategy that takes the issues the proponent raises into account, as evidenced ty its declining greenhouse gas emissions intensity. The board says its IRPs and other public disclosures already fulfill the requests set forth in the shareholder resolution, and therefore that a report such as the one NYSCRF requests would be duplicative and a waste of company resources.

Item 9	
Resolved Clause	Resolved: Shareholders request Dominion issue a report (by October 2017, at reasonable cost, omitting proprietary information) reviewing the Company's policies, actions and plans to measure, monitor, mitigate, disclose, and set quantitative reduction targets for methane emissions resulting from all operations, including storage and transportation, under the Company's financial or operational control.
Lead Proponent	Arjuna Capital
Summary	The proponent is concerned about the disproportionate impact methane has on climate change, and recent evidence that atmospheric contributions from the oil and gas sector are greater than previously understood. Arjuna points to the recent Aliso Canyon leak as evidence of vulnerability the result of poor management. The proponent notes Dominion's exposure to depleted oil wells, which are especially prone to leaks, and notes concern that lost gas is lost revenue. Arjuna seeks a report on the company's management of these risks. Management responds that Dominion already publishes a report that addresses these topics, and participates in several voluntary government plans to reduce methane emissions. As such, the board says the requested report would be duplicative and a waste of company resources.

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 generation[2] 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 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

[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.

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 transition 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 IRRC 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. Dominion was among the companies evaluated in that study.

This Action Report addresses carbon asset stranding, the 2-degree scenario, greenhouse gas emissions and climate change, which are discussed in greater detail in *Si2's 2017 Briefing Paper on Climate Change* and *Briefing Paper on Environmental Management.*

II. Dominion Resources

Dominion is one of the nation's largest producers and transporters of energy. The company operates through three segments: Dominion Virginia Power (DVP), Dominion Generation and Dominion Energy.

- The DVP segment engages in the regulated electric transmission and distribution operations that serve residential, commercial, industrial and governmental customers in Virginia and North Carolina.

Financials			
($ millions)	**2016**	**2015**	**% Change**
Operating Revenue	$11,737	$11,683	0.5%
Net Income	$2,123	$1,299	63.4%

- The Dominion Generation segment is involved in the electricity generation activities through gas, coal, nuclear, oil, renewables, biomass, hydro, solar and power purchase agreements; and related energy supply operations. It also comprises generation operations of the company's merchant[3] fleet and energy marketing, and price risk management activities for its assets.
- The Dominion Energy segment engages in the regulated natural gas distribution operations, gas transmission pipeline and storage operations, natural gas gathering and processing activities, and liquefied natural gas operations. This segment serves residential, commercial and industrial customers.

As of December 31, 2016, the company's portfolio of assets included approximately 26,400 megawatts of generating capacity; 6,600 miles of electric transmission lines; 57,600 miles of electric distribution lines; 14,900 miles of natural gas transmission, gathering and storage pipelines; and 51,300 miles of gas distribution pipelines. It served approximately 6 million utility and retail energy customers, and operated underground natural gas storage systems with approximately 1 trillion cubic feet of storage capacity. In addition, the company sells electricity at wholesale prices to rural electric cooperatives, municipalities and into wholesale electricity markets.

In September 2016, Dominion completed its acquisition of Dominion Questar, an integrated natural gas company, for $4.4 billion.

In March 2014, Dominion formed Dominion Midstream, a master limited partnership (MLP) designed to grow a portfolio of natural gas terminaling, processing, storage, transportation and related assets. An MLP is a type of business organization that exists in the form of a publicly traded limited partnership. MLPs are most commonly present in the energy industry, providing and managing resources such as oil and gas pipelines. These types of business endeavors are conducive to producing regular income, thus enabling MLPs to offer attractive income yields, because they earn stable income that is often based on long-term service contracts. Essentially, MLPs are tax-exempt, publicly traded companies that own pipelines, storage tanks and other cash-generating energy infrastructure, and transfer the bulk of their income to shareholders in the form of distributions. Some analysts now see unique risk in this structure associated with declining income from pipeline assets.

Dominion says in its 2016 Form 10-K that its strategy is to be a leading provider of electricity, natural gas and related services to customers primarily in the eastern region of the United States. Dominion is focused on expanding its investment in regulated electric generation, transmission and distribution and regulated natural gas transmission and distribution infrastructure. Dominion expects 80 percent to 90 percent of future earnings from its primary operating segments to come from regulated and long-term contracted businesses. As part of its transition to a more regulated earnings mix, Dominion has been making capital investments in regulated infrastructure and selling or decommissioning merchant coal and nuclear generation facilities.

[3] While established utilities continue to build and operate plants that produce electricity, a growing number of so-called "merchant generators" build power capacity on a speculative basis, or have acquired utility-divested plants. These companies then market their output at competitive rates in unregulated markets.

Dominion continues to expand and improve its regulated and long-term contracted electric and natural gas businesses, in accordance with its existing five-year capital investment program. The company says that a major impetus for this program is to meet the anticipated increase in demand in its electric utility service territory. Other drivers include the construction of infrastructure to handle the increase in natural gas production from the Marcellus and Utica Shale formations, to upgrade Dominion's gas and electric transmission and distribution networks, and to meet environmental requirements and standards set by various regulatory bodies. Investments in utility solar generation are expected to be a focus in meeting such environmental requirements, particularly in Virginia. In September 2014, Dominion announced the formation of Atlantic Coast Pipeline. Atlantic Coast Pipeline is focused on constructing an approximately 600-mile natural gas pipeline running from West Virginia through Virginia to North Carolina, to increase natural gas supplies in the region.

Generation Mix

Dominion's coal and nuclear facilities continued to dominate its generating sources in 2016, with natural gas having rapidly grown in prominence to parity with its nuclear output. Natural gas slightly displaced coal, but primarily grew at the expense of purchased power, which the company does not break out by energy source.

Dominion Resources Actual System Output by Energy Source			
	2016	2015	2014
Nuclear	31%	30%	33%
Natural Gas	31%	23%	15%
Coal	24%	26%	30%
Purchased Power, net	8%	15%	19%
Other, including oil, hydro, biomass & solar	6%	6%	3%

Dominion's merchant fleet comprises various renewable generation facilities, which include a fuel cell generation facility in Connecticut and solar generation facilities in operation or development in nine states, including Virginia. The output of these facilities is sold under long-term power purchase agreements with terms generally ranging from 15 to 25 years.

Integrated Resource Plan: Dominion Virginia Power filed its 2016 Integrated Resource Plan (IRP) with Virginia and North Carolina in May of last year, indicating it would pursue a broad array of generation over the next 15 years including license extensions at all four of its nuclear facilities. The plan also calls for development of 400 MW of utility-scale solar in Virginia by 2020, and another 600 MW of non-utility solar in both states by 2017.

The utility highlighted a variety of plans with different compliance options addressing uncertainty surrounding the fate of the Obama administration's Clean Power Plan (CPP), but closing 323 MW of coal-fired generation at its Yorktown station is a common element among all of them. Dominion's proposals highlight the uncertainty surrounding the CPP, but the utility said the 15-year IRP "strongly focuses on expanding low- and zero-carbon forms of energy generation as the company develops its final approach."

This filing comes after the utility defended its substantial investment in analyzing the potential for building a new unit at its North Anna nuclear facility. The idea had been controversial since its inception. Dominion's IRP at the time showed nuclear to be more expensive than new gas or renewable infrastructure.

In its latest plan, the company has filed five approaches to long-term resource procurement with the Virginia State Corporation Commission (SCC), including one plan specifically designed to provide the lowest-cost option, while four alternative approaches meet customer needs while complying with new carbon regulations. The utility said it "continues to evaluate significant changes in its generation system and will comply with the new requirements while staying focused on keeping electricity highly reliable and holding down energy costs as much as possible."

Among Dominion's proposals, it would test two wind turbines offshore Virginia Beach, complete almost 1,600 MW of gas-fired generation by 2019 and apply for operating license extensions at all of its nuclear facilities, Units 1 and 2 at the Surry and North Anna plants.

The main differences among the plans are summarized below. New capacity across these plans differs because each would retire different amounts of coal-fired capacity—the greater the coal retirements, the more new capacity.

- *Plan A: No CO2 Limit*—A least-cost plan for the scenario in which there are no carbon regulations. All new generation would be gas-fired.
- *Plan B: Rate-based dual rate*—Would add 1,100 MW of solar, plus an additional 3,641 MW of gas-fired capacity.
- *Plan C: Rate-based state average*—Would add 3,400 MW of solar, plus an additional 2,049 MW of gas-fired capacity.
- *Plan D: Mass-based emissions cap—existing units only*—Would add 2,400 MW of solar, plus 3,641 MW of gas-fired capacity.
- *Plan E: Mass-based emissions cap—existing and new units*—Would add 7,000 MW of solar, plus 2,435 MW of gas-fired capacity, plus 1,452 MW of capacity at a new nuclear unit at North Anna

In its plan, Dominion questions what ultimate carbon restrictions it will face and lays out a variety of plans. "One must ask, will the CPP remain in its current form or will it be revised? Also, should the CPP remain intact as promulgated, what happens beyond the 2030 final target date?" Dominion concluded, "when considering questions such as these, it is reasonable to anticipate that resources such as North Anna 3, offshore wind, and new demand-side resources may be required."

Demand-side plans, including some already approved by Virginia regulators, would reduce peak load by 330 MW by 2031—the final year of the planning cycle. The program aims to save more than 750 GWh annually.

Clean energy advocates pushed back against Dominion's IRP in regulatory proceedings on three major points:

1) Inflated Future Demand and Becoming an "Island"—Electricity demand in Virginia has been generally flat for the past several years, and with ongoing efficiency improvements, many predict that it will remain so, even as the population and economy grow. However, Dominion's model forecasts steady demand growth. The regional transmission organization, PJM, changed its forecasting model in 2014 because it observed in recent years that electricity demand no longer closely tracks economic consumption. PJM's new modeling approach accounts for this decoupling of economic growth and energy demand. By contrast, Dominion's model still uses the old assumptions, tending to produce an inflated picture of demand.

Dominion pairs this demand forecast with another contentious assumption: the company says that it cannot rely on carbon credit trading or purchasing power on the wholesale market to meet customer demand and comply with carbon regulations. Instead, Dominion intends to generate most of the power needed to meet demand. The company asserts that this "island" approach to compliance is the prudent, conservative decision in a time of uncertainty.

SCC judges were sympathetic to Dominion's view on credit trading, but not on purchases. Historically, Virginia has been anything but an island, buying and selling electricity in the PJM wholesale market, which includes parts or all of 13 states plus Washington, D.C. Virginia is usually a net importer, relying on

power generated in other states to satisfy 10 to 15 percent of demand. Moving from being a net importer to purchasing almost no power from other states would represent a major shift.

The company also largely rejected the notion of meeting its projected growing demand with new renewable capacity. At the regulatory proceedings, Dominion expressed concerns about the effect that adding large amounts of renewable generation could have on grid reliability. However, a 2014 study commissioned by PJM found that the regional grid "would not have any significant reliability issues operating with up to 30% of its energy (as distinct from capacity) provided by wind and solar generation."

As a point of reference, solar and wind currently provide less than 1 percent of the energy for electric generation in Virginia. According to the U.S. Energy Information Administration, the fuel mix for electric generation in Virginia comprises approximately 40 percent gas, 33 percent nuclear, 20 percent coal, 5 percent biomass, and less than 2 percent hydroelectric. If the PJM study is accurate, then there is room to bring a significant amount of renewable generation online before reliability becomes a concern.

2) Inflated Cost of Solar Energy—The main reason that Dominion did not include more solar in its IRP is that it assumed solar to be expensive. The plan adds an "integration charge" of $390.43 per kilowatt for all new solar generation. Clean energy advocates argued in regulatory proceedings that this surcharge is higher than it should be—up to 35 times higher—creating an inherent bias against solar when it comes to least-cost planning and comparing alternatives.

3) Unwillingness to Make Big Shifts to Renewables—Through legal discovery and public testimony at its regulatory proceedings, Dominion revealed that an early version of Plan E contained an additional 15,000 MW of solar power and did not include a new nuclear unit. This was referred to as Plan S, and it cost more than $1 billion less than the published Plan E. Experts testified that if Dominion had used a reasonable solar surcharge in its modeling, Plan S might have been up to $4 billion cheaper. When pressed, Dominion witnesses again cited their fear that deploying large amounts of solar all at once could present reliability issues.

On December 14, 2016, the SCC approved Dominion's IRP, including all of the scenarios, as a long-term planning guide. Under state law, Dominion still will need SCC approval to implement any of the individual projects in the IRP. Next year the SCC is requiring Dominion to model plans without placing caps on the amount of power that can be bought or sold on the wholesale market. The order also says that Dominion must model "regional" as well as "island" approaches to CPP compliance next year for comparison. The order does not address Dominion's method of modeling future demand, nor does it address the company's approach to pricing solar resources.

Renewables & New Technologies

Dominion Resources says that renewable energy is an "important and growing" part of its energy portfolio. The company says it plans to expand its share of renewable energy in the coming years, but does not provide specific targets in this regard. It outlines some projects in its most recent Corporate Social Responsibility report, but these are mostly designed to comply with renewable portfolio standards in Virginia and North Carolina. Beyond that, the company says it is evaluating the latest technology research in emerging alternative energy sources to "assess commercial viability." Meanwhile, the company sees a threat in expanded uptake of renewables and other technologies. In its 2016 Form 10-K, Dominion says:

> Virginia Power's business model is premised upon the cost efficiency of the production, transmission and distribution of large-scale centralized utility generation. However, advances in distributed generation technologies, such as solar cells, gas microturbines and fuel cells, may make these alternative generation methods competitive with large-scale utility generation, and change how customers acquire or use our services.

> Reduced energy demand or significantly slowed growth in demand due to customer adoption of energy efficient technology, conservation, distributed generation, regional economic conditions, or the impact of additional compliance obligations, unless substantially offset through regulatory cost allocations, could adversely impact the value of the Companies' business activities.
>
> Dominion Gas has experienced a decline in demand for certain of its processing services due to competing facilities operating in nearby areas.

Renewable Portfolio Standards (RPS): Virginia and North Carolina have renewable energy targets. Virginia's voluntary renewable portfolio standard (RPS) calls for 4 percent of a company's base year generation (2007) to be from renewable resources by 2010, 12 percent by 2022 and 15 percent by 2025. North Carolina's mandatory RPS calls for 12.5 percent renewable power by 2021.

Dominion also must report annually to the Virginia State Corporation Commission on the company's progress in advancing renewable energy. Virginia Power's *2016 Annual Report on Renewable Energy* says it submitted that in November. Virginia Power exceeded the RPS's 2015 milestone and plans to meet the remaining targets in both states by using existing renewable facilities, adding renewable generation "where feasible," and purchasing renewable energy certificates, as permitted by each RPS program. Virginia Power reported generating enough renewable energy from its own resources (including non-utility generators) to meet 81 percent of its 2015 RPS goal in Virginia and banked portions of this renewable energy. The company reports on some renewables projects under development, although these are very small in relation to its overall generation.

Dominion Resources was among the lowest scoring companies in a 2014 ranking by Ceres of companies' clean energy deployment. The company was ranked last on measures of incremental annual energy efficiency. The report did not include nuclear or utility-scale hydro:

> Utility-scale hydroelectric and nuclear power are important energy resources that contribute about a quarter of U.S. electricity generation; however, we do not include them in this report because nearly all of the country's large hydro and nuclear generation was built prior to 1980, and neither resource is widely expected to constitute a large portion of the nation's newly built carbon-free energy portfolio going forward… In the U.S., low natural gas prices, near-zero electricity demand growth and strong renewable energy growth have suppressed wholesale power prices, cut into utility revenues and forced unanticipated closures of newly unprofitable base load coal and nuclear plants.

Conservation and Load Management

Virginia's Electric Utility Regulation Act provides incentives for energy conservation and sets a voluntary goal to reduce electricity consumption by retail customers in 2022 by 10 percent of the amount consumed in 2006. Legislation in 2009 added definitions of peak-shaving and energy efficiency programs and allowed for a margin on operating expenses and revenue reductions related to energy efficiency programs.

Demand-side management: Virginia Power's demand-side management (DSM) programs provide the first steps toward achieving the voluntary 10 percent energy conservation goal. The base case in the company's 2016 IRP called for approved DSM programs reaching approximately 296 MW by 2030, and proposed and future DSM programs reaching approximately 315 MW by 2030. Virginia Power offers the following DSM programs in Virginia:

- **Home Energy Improvement—**energy audits and improvements for homes of low-income customers;
- **Smart Cooling Rewards—**incentives for residential customers who voluntarily enroll to allow Virginia Power to cycle their air conditioners and heat pumps during periods of peak demand;
- **Residential Bundle Program—**a bundle of four residential programs to be available to residential customers, including a Residential Home Energy Check-up Program, Residential Duct Testing & Sealing Program, Residential Heat Pump Tune-Up Program and Residential Heat Pump Upgrade Program;

- **Commercial Energy Audit Program—**an on-site energy audit providing commercial customers with information to evaluate potential energy cost savings options;
- **Commercial Duct Testing & Sealing—**an incentive for commercial customers to seal duct and air distribution systems to improve system efficiency;
- **Commercial Heating and Cooling Efficiency Program—**incentives to install high efficiency heating and cooling equipment;
- **Commercial Lighting Systems and Controls Program—**incentives to install energy efficient lighting and controls**;**
- **Commercial Distributed Generation—**a redesigned distributed generation program allowing customers to commit their on-site back-up generators to Virginia Power during periods of peak demand; and a
- **Commercial Solar Window Film Program—**incentives to install window film to reduce solar radiation.

Virginia Power offers the three residential programs and the first four commercial programs listed above in North Carolina. In Ohio, East Ohio offers three DSM programs.

Smart grid: Virginia Power is assessing smart grid technologies through a demonstration that involves a limited deployment, within Virginia Power's Virginia service territory, of smart meters that use digital technology to enable two-way communication between the meter and Virginia Power's electric distribution system. The technology is intended to help customers monitor and control their energy use and lead to more efficient use of the power grid, resulting in energy savings and lower environmental emissions. Depending on the demonstration's outcome and certain regulatory proceedings, Virginia Power may make a significant investment in replacing existing meters with Advanced Metering Infrastructure. By 2016, AMI accounted for 12.24 percent of the company's residential metering, 13.36 percent of commercial and 3.29 percent of industrial. By comparison, Virginia's other major investor-owned utility—**American Electric Power**—had virtually no AMI deployed in the same period.

Board Representation

In April 2016, Si2 published an analysis of the U.S. electric utility industry and its response to climate change; the report, with backing from the IRRC Institute, takes a look at 12 key metrics for the industry covering board oversight and director climate change expertise, climate change risk exposure and political involvement. Dominion Resources was among the top 25 U.S. investor-owned utilities we analyzed. One of the elements we examined was environmental and climate change expertise on boards of directors. The following information has been updated to reflect the current situation at Dominion.

Most of the utilities, including Dominion Resources, have explicit board committee obligations for environmental oversight, as articulated in one or more of their committee charters. Only three—**Ameren**, **Exelon** and **PG&E**—have climate change-specific board oversight responsibilities. Even those three mention climate change only once in their board oversight documentation, and do not elaborate further.

Discernible climate change expertise among the board members across our research universe is sparse. Several members whose environmental experience is noted in company proxy statements seem to specialize most often in legal compliance. Company descriptions of those few members with robust backgrounds in environmental or climate change issues do not particularly highlight this aspect of their skill sets. Additionally, among those board members with notable experience in the environmental or climate change arena, many of them have additional elements of their profiles that suggest they may not be advocates for business models that mitigate climate change risk. Across the 25 utilities we studied, 10 have at least one board member with environmental expertise, and three—**Duke Energy, Edison International** and **PG&E**—have a member with climate change expertise.

None of Dominion Resources' board members has environmental or climate change expertise. Their expertise is mostly in utilities, finance, business management or law. Dominion says in its 2017 proxy

statement that one board nominee, Ronald W. Jibson, has environmental expertise, although this appears to be derived only from his tenure as the head of a utility rather than any specific qualifications.

The company says in its opposition to the proposal that it does not believe it should require particular types of specialists, and that its directors' responsibilities are not limited to any single issue. However, one board member, Pamela J. Royal, appears to have been selected specifically for her strength in community relations, rather than any particular background in Dominion's areas of operation.

> Dr. Royal is a board-certified dermatologist and has been the owner and president of Royal Dermatology and Aesthetic Skin Care, Inc. since 1990. She received her medical degree from Eastern Virginia Medical School of the Medical College of Hampton Roads and served her residency at Howard University Hospital in dermatology. Dr. Royal serves or has served on a number of boards, including those of the Valentine Richmond History Center (immediate past chair), the United Way of Greater Richmond and Petersburg (former chair), The Community Foundation, CenterStage Foundation, the Greater Richmond Chamber of Commerce, J. Sargeant Reynolds Community College Foundation, Bon Secours Richmond Health System, Venture Richmond, and the Virginia Early Childhood Foundation. Dr. Royal serves on the Audit Committee.
>
> Dr. Royal's qualifications to serve as a director include her active community leadership and service to numerous non-profit organizations, both as a member and in various leadership positions. Her community involvement was recognized with the Richmond, Virginia YWCA Outstanding Women's Award for Volunteerism in 2010. She demonstrates civic and public interest involvement and brings alternative and diverse perspectives on the many matters that the Board addresses.

In March 2016, the investment committee for California Public Employees' Retirement System (CalPERS) voted to start requiring the corporations it invests in to include people on their boards who have expertise in climate change risk management strategies. It is the first U.S. pension system to establish such a requirement.

Climate Change Risk

In its 2016 Form 10-K, the bulk of Dominion's limited discussion of climate change relates to compliance and regulatory developments. The company does at one point acknowledge, in general terms, the risk climate change poses to its operations:

> Fluctuations in weather can affect demand for the Companies' services. For example, milder than normal weather can reduce demand for electricity and gas transmission and distribution services. In addition, severe weather, including hurricanes, winter storms, earthquakes, floods and other natural disasters can disrupt operation of the Companies' facilities and cause service outages, production delays and property damage that require incurring additional expenses. Changes in weather conditions can result in reduced water levels or changes in water temperatures that could adversely affect operations at some of the Companies' power stations. Furthermore, the Companies' operations could be adversely affected and their physical plant placed at greater risk of damage should changes in global climate produce, among other possible conditions, unusual variations in temperature and weather patterns, resulting in more intense, frequent and extreme weather events, abnormal levels of precipitation and, for operations located on or near coastlines, a change in sea level or sea temperatures.

In its most recent Corporate Responsibility Report, Dominion offers its position on climate change:

> We believe that a national climate change policy should be developed legislatively, together with a sound national energy policy that provides for fuel diversity, a reliable energy supply and affordable electric service, as well as regulatory certainty and compliance flexibility for industry. This policy should promote the development and deployment of technology-based solutions, including renewable energy, advanced nuclear, natural gas and clean-coal technologies, as well as energy efficiency, conservation and demand-side management programs.

The company says that the cornerstone of its climate change strategy is diversification, and that it focuses its efforts around the following initiatives:

- Enhance conservation and energy efficiency programs
- Expand renewable energy portfolio
- Evaluate other new generating capacity
- Construct new electric transmission infrastructure
- Construct new natural gas infrastructure
- Enhance voluntary methane mitigation efforts

A significant portion of Dominion's electric transmission and distribution network is and continues to be planned for coastal areas. Dominion plans to build a large new liquefied natural gas export facility in coastal Maryland and a new gas pipeline from West Virginia to North Carolina. The proposed pipeline includes a spur to coastal Virginia, the second most vulnerable population area to sea-level rise in the U.S. after New Orleans.

Dominion says in its *2014 Greenhouse Gas Report* (the most recent available) that as an electric service provider to the Outer Banks of North Carolina and the coastal areas of Virginia, it has substantial experience operating in areas prone to extreme weather events such as hurricanes. Dominion dealt with Hurricane Sandy in late 2012, and the three most costly storms in Dominion's operating history of more than 100 years have occurred in the last decade—Hurricane Isabel, Hurricane Irene and a June 2012 derecho (a straight-line windstorm associated with fast-moving, severe thunderstorms).

While Hurricane Isabel was its most costly storm, Dominion reported to the Virginia State Corporation Commission that the costs associated with Hurricanes Irene and Sandy, and the late June 2012 summer storms, exceeded $200 million:

- **Hurricane Isabel**—Hurricane Isabel in 2003 resulted in an after-tax cost of $128 million. Lost power reduced operating earnings by 4 cents per share; 80 percent of Dominion's electric customers, or about 1.8 million homes and businesses, lost power as a result of the storm. Service was restored in two weeks with the largest workforce ever assembled by the company.
- **Hurricane Irene**—Dominion's restoration effort following Hurricane Irene in August 2011 was the second largest in its history; half of its Virginia customers lost service. Virginia Power restored electricity to 1.2 million customers within eight days, according to Dominion's 2012 response to CDP. In March 2012 it received an award for its restoration efforts. Storm costs associated with Irene totaled approximately $107 million. Dominion recorded a $59 million after-tax charge reflecting associated restoration costs.
- **June 2012 derecho**—The event was the most significant of a series of late June summer storms. More than one million of its customers lost power as a result of the derecho. Some 95 percent of its customers had power restored within five days, and all were returned to service within another three days. Dominion recorded a $53 million after-tax charge reflecting associated restoration costs.
- **Hurricane Sandy**—Finally, while Virginia was largely spared the brunt of Hurricane Sandy in November 2012, this storm required more than $17 million in restoration costs.

Greenhouse Gas Emissions

Dominion publicly reports on its greenhouse gas emissions in its annual Form 10-K filings, its semi-annual Corporate Social Responsibility Report and its *2014 Greenhouse Gas Report* (the most recent year available), but has not established greenhouse gas emissions reduction targets or timetables. Dominion

stopped responding to CDP's climate change questionnaires in 2013, after providing annual responses for a number of years.

Dominion reports that its entire electric generating fleet (based on ownership percentage) reduced its average CO_2 emissions rate per MWh of energy produced from electric generation by about 43 percent between 2000 and 2015, and its total emissions volume by 21 percent over the same period.

In Dominion Resources' 2017 proxy statement, the board of directors specifically notes that the company has reduced emissions "by 81% for nitrogen oxide (NOx), 96% for mercury (Hg), and 95% for sulfur dioxide (SO_2) from 2000 levels." While these compounds each contribute to environmental degradation and their containment is thus important, their contribution to climate change is not nearly as significant as carbon dioxide and methane. Management did not address those emissions in its opposition statement.

Methane emissions: Dominion does not directly provide data specifically on its methane emissions to the public, beyond that which it is required to report through EPA's FLIGHT database, discussed earlier in this report. Dominion Transmission participates in EPA's Natural Gas STAR, a voluntary program that provides companies with a framework for implementing technologies and best practices to reduce and document methane emissions. Dominion's local distribution company, East Ohio Gas Co., joined in 2014. In its 2016 Methane Management Report, Dominion reported methane emission reductions of more than 4.4 billion cubic feet since 2008. Dominion provides a fairly detailed breakdown of its methane emissions sources, and where in its system it experiences the most significant leaks. The company also describes its methane emissions control efforts at some length. It does note, however, that it has not set specific reduction targets. Dominion also does not report on leakage rates, an important figure considering that studies have found leakage rates above 2.7 percent cancel out natural gas' climate change advantage over coal. The company makes no mention of how it manages risk at its natural gas storage facilities.

In March 2016, the EPA recognized Dominion as a founding partner in its Natural Gas STAR Methane Challenge Program, which provides aims to provide a new mechanism for oil and natural gas companies to measure and reduce methane emissions.

Methane field study—Dominion partnered in a nationwide field study led by Colorado State University and the Environmental Defense Fund to quantify methane emissions from natural gas pipeline and storage systems. As part of the study, it provided historic emissions and operating data to complement measurements taken by the research team during the second half of 2013. The study was released in February 2015 in the journal of *Environmental Science and Technology*.

Emissions reduction efforts: Dominion says it has an integrated voluntary strategy for reducing overall greenhouse gas emissions intensity with diversification as its cornerstone. The six principal components of the strategy include initiatives that address electric energy management, electric energy production, electric energy delivery and natural gas storage, transmission and delivery:

- Enhance conservation and energy efficiency programs;
- Expand its renewable energy portfolio;
- Build low-emissions, natural-gas fired and emissions-free nuclear plants;
- Construct new electric transmission infrastructure;
- Construct new natural gas infrastructure; and
- Implement and enhance voluntary methane mitigation measures through the EPA's Natural Gas STAR Program.

Potential liability: In 2012, the Virginia Supreme Court ruled that utilities are not protected from lawsuits related to damage from their greenhouse gas emissions, opening Dominion up to legal liability for its emissions.

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 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.

From among the top 25 U.S. investor-owned utilities Si2 covered in our recent survey, the following table shows the 12 covered in the Oxford study, along with their risk ranking for each scenario from 1 to 100. Dominion ranks below average on the risk scale. Its greatest risks are related to its aging power station fleet, which is not suitable for CCS retrofit.

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*
Entergy	52	72	11	1	1	100	100	*48.1*

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***
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*

Shareholder Support for Item 8

On March 30, 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 1,733,000 shares in Dominion Resources. 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 Dominion Resources Inc. being one of them. Further, we believe proposal #8 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.

III. Proponent Positions

Item 7 (Nominate environmental expert to board)

The proponent, Joy Loving, is concerned about the significant and growing challenges that climate change and environmental issues pose to businesses in general, and utilities in particular, noting, "The company must mitigate environmental challenges and manage climate risk in an effective, strategic and transparent manner to minimize its operations' adverse environmental impacts." The proponent believes the company would benefit from addressing these risks at "the most strategic level," and that an authority on climate change on the board of directors would most effectively achieve this aim. The proponent particularly suggests that this person would be best equipped to assess the "climate risk and other environmental and health impacts of such large projects as the currently proposed VA pipelines." The proponent specifies that this person should have a high level of widely recognized expertise in climate science, and that their directorship should be independent.

Item 8 (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 climate change and the growing regulatory and consumer initiatives to mitigate those risks. In particular, the proponent highlights declining energy demand as a risk to utilities' fundamental operating structures.

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 Dominion Resources does not provide sufficient information on its long-term strategy to decarbonize, and that it is concerned the company does not have a decarbonization plan that is consistent with the Paris agreement. NYSCRF believes that an impact assessment would help the company plan for the future, asserting that Dominion "is not properly accounting for the risk of its current high investment in carbon-intensive generation."

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 9 (Report on methane emissions/reduction targets)

Arjuna Capital is concerned about substantial research that indicates methane leaks from gas operations could erase the climate benefits of reducing coal use. The proponent points to methane's outsized contribution to climate change, as well as a 2016 *Nature* study that found oil and gas sector methane emissions to be 20 to 60 percent higher than previously thought.

The proponent points to the 2015 Aliso Canyon methane leak as demonstrative of "major vulnerabilities in the maintenance and safety of natural gas storage facilities. The incident exposed both a lack of oversight and contingency planning in the face of a well blowout." The proponent highlights the tremendous severity of the Aliso Canyon leak, and the substantial financial liabilities--$700 million so far—and criminal and civil actions that have since plagued the responsible company.

Arjuna notes Energy Information Agency (EIA) findings that of 400 gas storage facilities around the United States, more than 80 percent are located in depleted oil wells, which present additional leakage risks. The proponent observes that Dominion has storage facilities that are likely to pose similar risks, noting that the company is estimated to hold the third highest natural gas volume in the country.

The proponent asserts that insufficient methane emissions management on the part of companies may invite increased regulatory scrutiny, highlighting the Obama-era effort to reduce oil and gas sector methane emissions and enhance disclosure requirements. The proponent does not address the fact that the current administration plans to roll back those requirements. The proponent also notes the economic cost of methane lost to leakage, which is thus not available for sale.

Arjuna seeks a report from Dominion Resources "reviewing the Company's policies, actions and plans to measure, monitor, mitigate, disclose, and set quantitative reduction targets for methane emissions resulting from all operations, including storage and transportation, under the Company's financial or operational control." The proponent thinks this report should include:

> the leakage rate as a percentage of production, throughput, and/or stored gas; management of high risk infrastructure; best practices; worst performing assets; environmental impact; reduction targets and methods to track progress over time. Best practice strategy would utilize real-time measurement and monitoring.

IV. Management Positions

Item 7 (Nominate environmental expert to board)

Dominion says its process for director selection is already effective. The board believes that it does not serve shareholders' best interests to specify a particular type of specialist, and that directors' fiduciary duties are not limited to any one issue. It says the board represents "a diverse group of individuals with broad experience," and believes the proponent's request is too narrow and would unduly limit the board's ability to recruit the most qualified candidates.

Management says it has access to "extensive internal and external expertise on environmental matters," and that it receives periodic updates on these issues from senior management. It highlights Dominion's $2 billion in spending on environmental improvements to its generation since 1998, saying this has led to reductions in nitrous oxide, mercury and sulfur dioxide. Management does not discuss the more potent greenhouse gases—carbon dioxide and methane—in its response. The board points to its "extensive" environmental disclosures in its 2014 Greenhouse Gas Report and latest Corporate Responsibility Report. "For these reasons, the Board does not believe that it would be in the best interests of shareholders or be appropriate to select a director exclusively on the basis of a single criterion or area of expertise."

Item 8 (Report on climate change strategy)

Management says that the company is already planning for the future in the manner the proponent requests, including assessments of future developments consistent with the Paris agreement:

> The cornerstone of our integrated strategy is diversification through enhanced conservation and energy efficiency programs; expansion of our renewable energy portfolio; modernization of the electric grid; addition of low emission natural gas generation to its generation portfolio and evaluation of new nuclear and extension of licenses for existing nuclear to meet customers' future needs; construction of new natural gas infrastructure; conversion, sale or closure of certain coal-fired generation units; and enhanced methane mitigation measures.

The board also says that it is already required by law to produce the information the proponent requests, in the form of its annual Integrated Resource Plan (IRP) and that Dominion's IRP filing aims to identify the best ways to meet current energy needs and to consider future uncertainties. Management says it reports thoroughly on these matters in its IRP, as well as in its annual SEC filings and various thematic reports. The board says that this contributes to what it characterizes as a proven track record of clean generation and reliability when compared to its peers.

Management argues that its IRP is designed to do exactly what the proponent requests, and that its forecast scenarios (discussed earlier in this report) tackle the question of how to address the shifting demands on energy provision in the future. The board highlights the uncertain fate of the CPP, saying this has not yet led to any changes in the company's own plans.

The board notes the declines in absolute and relative greenhouse gas emissions at Dominion over the last 15 years, and highlights some examples of external praise it has received for its performance. Because management believes its IRP provides reporting that is substantially in line with what the proponent requests, it says any additional report would be duplicative and an unnecessary waste of company resources.

Item 9 (Report on methane emissions/reduction targets)

Dominion's board of directors opposes the resolution, saying it has developed an integrated strategy for reducing greenhouse gas emissions that is based on maintaining a diverse fuel mix, investing in renewable energy projects and promoting energy conservation and efficiency efforts. As for its reporting on its climate change strategy and associated risks, management says that Dominion has provided, and intends to continue to provide, appropriate disclosures to its investors regarding climate change and the risks it poses.

The board points to its participation in several voluntary methane emissions reduction initiatives, and says it fully supports "the Interim Final Rule on gas storage issued by the Pipeline and Hazardous Materials Safety Administration that became effective in January 2017 and includes requirements for storage well integrity."

Dominion points to several reports—including its annual SEC filings, CSR report, greenhouse gas report and methane management report—that contain discussions regarding material risks, including financial risks, issues frequently associated with climate change. Management believes that preparation of an additional report would be duplicative and an unnecessary waste of company resources.

V. Analysis

Key Points at Issue

- Do specific company circumstances warrant a climate change report?
- Is Dominion doing enough to manage climate change risks?
- Is Dominion's board adequately equipped to guide the company through current and future challenges?
- Does Dominion sufficiently disclose risks associated with its methane emissions?

For additional analysis, please refer to Si2's 2017 Briefing Paper - Environment (Climate Change) and Environmental Management. The following analysis is specific to Dominion Resources.

Dominion Resources is one of the nation's largest producers and transporters of energy. Dominion's strategy is to be a leading provider of electricity, natural gas and related services to customers in the eastern region of the United States. The company plans to invest heavily in its natural gas gathering and infrastructure, and says it will also increase utility scale solar, although the latter continues to make up a very small portion of Dominion's overall energy mix.

While Dominion is evaluating the "commercial viability" of various alternative technologies that are increasingly capturing market share in the electric utility industry, the company's primary focus appears to be centered on expanding its natural gas capacity and continuing to reinforce its nuclear capacity. Indeed, the company primarily discusses distributed generation, renewable expansion with battery storage, and other such technologies in terms of their threat to its business model, rather than as an opportunity. The company notes that as these technologies become more available and affordable, this could

undermine demand for its own offerings, but does not provide clear guidance as to how it would respond.

Dominion said in its 2016 IRP that it was waiting for greater clarity on the evolution of the CPP before it would commit to any of its projected five pathways, each of which is quite different in scope and impact. If the company's existing level of investment is any guide, Dominion is putting its money into natural gas and nuclear.

Much of Dominion's discussion seems to assume the viability of both natural gas and nuclear energy, and to hinge significantly on their status as low- or no-emission sources of electricity. The reasoning in both cases is complicated.

Natural gas: The United States is burning less coal, replacing it in part with natural gas. Many have seen natural gas as a "bridge fuel" that will carry the country from its dependence on heavily emitting fossil fuels to a new era in which wind and solar supply the bulk of U.S. power. However, recent studies suggest that natural gas' greenhouse gas emissions may have been dramatically understated. If more research confirms this conclusion, natural gas' climate-friendlier credentials could be substantially undermined. However, as the CPP appears to be sputtering out of existence, natural gas may survive on its economic strength alone for quite some time.

Nuclear: The fact that nuclear energy is free of greenhouse gas emissions is not in question. Indeed, there is strong evidence that nuclear can play a key role in preventing mortality associated with greenhouse gas emissions. Under a purely fact-driven risk analysis framework, many credible sources find that the existing harm that is already a result of fossil fuel combustion far exceeds even the potential harm associated with a nuclear accident. Nuclear's political viability, however, is not so assured. There is strong public opposition to nuclear power, and the 2011 Fukushima accident only reinforced popular fear of the technology. An April 19, 2016, opinion piece in *The New York Times* posited that while conservative bias may inhibit some types of climate change action, liberal bias against nuclear may block other progress in containing greenhouse gas emissions.

Undoubtedly, alternative energy sources and technologies all present their own sets of risks, some more immediate than others. In light of this, it would seem that a comprehensive analysis on the part of an electric utility would be a necessary condition for sustained operational success. Investors must weigh whether Dominion is already conducting such an analysis to a sufficiently thorough standard.

The company provides some detail on its existing performance on various factors related to climate change. Dominion shows a steady decline in carbon dioxide emissions in recent years, and recently started publishing a methane management report that offers information regarding the company's leak containment initiatives, partly in response to previous shareholder resolutions. Dominion does not currently set targets for emissions reduction. Dominion acknowledges that increasing extreme weather events present a physical risk to its operations, but does not offer information as to how it plans to mitigate such risk.

One proponent believes that Dominion would manage all of these issues more effectively if it had a climate change expert on its board of directors. While the company argues that specifying a single area of expertise in a board search would be unduly confining, Dominion has one sitting board member who would appear to have been selected for a specific area of expertise: community relations. Her bio does not appear to lend itself to the electric utility industry in other ways. Investors will want to consider whether the company has already made a single factor selection of a board member, and whether it should do so on the basis of climate change risk.

Another proponent, the New York State Common Retirement Fund (NYSCRF), raises concerns about growing evidence that anthropogenic climate change is already having serious impacts on the environ-

ment 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 Dominion 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.

A third proponent notes specific concerns with regard to methane emissions, pointing to studies that find methane's climate advantage over coal evaporates if leakage rates exceed 2.7 percent. Dominion Resources does not disclose its leakage rates, so investors are unable to evaluate if the company's natural gas business presents the benefits it purports. Currently, 22 companies in North America and Europe provide their leakage rates as a percentage of natural gas production or throughput at given segment through disclosure to CDP. Further, the proponent is concerned about the fact that Dominion has underground gas storage facilities similar to the one that was the source of the disastrous Aliso Canyon leak, and that Dominion does not report on specific risk management strategies for those facilities.

Voting Considerations

Item 7 (Nominate environmental expert to board)

Votes in favor: Those investors who share the proponent's concern about the threat climate change poses to utilities' business models are likely to support this proposal, particularly if they believe that a board member equipped with climate change expertise would help Dominion manage the associated risks. They may also support this proposal if they believe Dominion has already selected one director on the basis of a single criterion, thus undermining management's objection.

Votes against: Investors who believe Dominion already has adequate processes in place to select its board members will reject this proposal. They may also vote against if they believe that Dominion's management and disclosure of its climate change risks is adequate as it stands, or if they believe that board-level expertise is not a necessary condition for better management of those risks.

Item 8 (Report on climate change strategy)

Votes in favor: Investors who share the proponent's view that future climate change is driving a fundamental revision of utility business models are likely to support this proposal. They are also likely to agree that Dominion has not adequately taken account of and/or reported on the transformation its industry is undergoing, and how it plans to adapt going forward. These investors are likely to share the proponent's view that Dominion is not keeping pace with existing and potential competitors in the evolving energy space. These shareholders are also likely to believe that even though the United States is retreating 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.

Votes against: Investors who are satisfied with the changes Dominion is making to its generating mix, along with its energy conservation and efficiency efforts, are likely to vote against the proposal. These investors are likely to agree with management that its annual IRP adequately addresses the company's view on and plans for the demands its sector faces both now and in the future. These investors may also be persuaded that the United States' recent retreat from climate-related regulation decreases the likelihood of regulatory pressure on carbon-intensive companies.

Item 9 (Report on methane emissions/reduction targets)

Votes in favor: Shareholders who generally want more information on how Dominion is approaching climate change will want to vote for the resolution. Shareholders who believe that there may be more risks to Dominion's business from climate change than currently understood and want the company to conduct a more detailed analysis will also want to vote for the resolution. These shareholders may be particularly concerned about recent revelations that methane emissions are more substantial than previously understood.

Votes against: Shareholders who are satisfied that the company is already adequately managing its methane emissions are likely to vote against this proposal. These investors may see Dominion's detailed disclosures to be sufficient as they stand. Those opposing this proposal may also view the company's participation in voluntary emissions reduction programs as evidence of its adequate management of associated risks.

Resources

- Dominion Resources' 2017 Proxy Statement
  https://www.sec.gov/Archives/edgar/data/715957/000119312517089312/d340312ddef14a.htm
- Dominion Resources' 2016 Form 10-K
  https://www.sec.gov/Archives/edgar/data/103682/000119312517060413/d334692d10k.htm
- Dominion Resources' *2015-2016 Corporate Responsibility Report*
  http://dominioncsr.com/assets/pdf/Dominion_CR_102016.pdf
- Dominion Resources' *2014 Greenhouse Gas Report* (most recent available)
  https://www.dom.com/library/domcom/pdfs/corporate/our-commitments/environment/greenhouse-gas-report.pdf
- Dominion's *2016 Integrated Resources Plan*
  https://www.dom.com/library/domcom/pdfs/corporate/2016-irp.pdf?la=en

- Dominion Resources' 2016 Methane Management Report
  https://www.dom.com/library/domcom/pdfs/corporate/our-commitments/community/environment/methane-management-report-2016.pdf?la=en
- Virginia Power's *2016 Annual Report on Renewable Energy*
  https://www.scc.virginia.gov/pur/renew/dvp_renew_16.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/
- Proponent support memo, Item 7
  https://www.ceres.org/investor-network/resolutions/add-board-member-with-env-expertise/@@download/attachment
- Proponent support memo, Item 9
  https://www.ceres.org/investor-network/resolutions/report-on-policies-practices-and-plans-related-to-methane-emissions/@@download/attachment