Welcome to your CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Headquartered in Akron, Ohio, FirstEnergy (FE) is a forward-thinking electric utility powered by a diverse team of employees committed to making customers' lives brighter, the environment better and communities stronger. Our subsidiaries are involved in the transmission, distribution, and regulated generation of electricity.

Our workforce of approximately 12,500 employees is dedicated to safety, reliability and operational excellence. Our 10 electric distribution companies form one of the nation's largest investor-owned electric systems, based on serving 6 million customers in Ohio, Pennsylvania, New Jersey, West Virginia, Maryland and New York. The company's transmission subsidiaries operate approximately 25,000 miles of transmission lines connecting the Midwest and Mid-Atlantic regions.

On March 31, 2018, the Board of Directors of FirstEnergy Solutions (FES) FirstEnergy's competitive generation segment made a voluntary filing under Chapter 11 of the United States Bankruptcy Code for FES, its subsidiaries and FirstEnergy Nuclear Operating Company (FENOC), to facilitate an orderly financial restructuring. The filing did not involve FirstEnergy or our Distribution, Transmission, Regulated Generation or Allegheny Energy Supply (AE Supply) subsidiaries. On September 25, 2018, the bankruptcy court approved a definitive agreement, subject to various conditions, that addressed FirstEnergy's obligations with respect to FES and FENOC. Upon emergence, FES will be a separate company unaffiliated with FirstEnergy and we will no longer report their data.

For the purposes of this CDP report, all financial and emissions information is based on FirstEnergy's 2018 year-end portfolio.

This report contains forward looking statements based on information available to the company. For more information, including our full forward looking statement please visit: https://www.firstenergycorp.com/content/fecorp/investor/engagement.html

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years

Row 1	January 1, 2018	December 31, 2018	No

C0.3

(C0.3) Select the countries/regions for which you will be supplying data.

United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Operational control

C-EU0.7

(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.

Row 1

Electric utilities value chain

Electricity generation
Transmission
Distribution

Other divisions

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	The President and Chief Executive Officer of FirstEnergy Corp, is responsible for management of climate change issues for FirstEnergy. The CEO is a member of the Board of Directors. FirstEnergy's Board of Directors provides oversight of significant issues for FirstEnergy including those related to climate change. Periodic updates, including those related to business strategy and legislative and regulatory policies and initiatives, are provided to the Board and/or Board committee on climate change by senior executives. The Board and the Board's Audit Committee and the Corporate Governance, Corporate Responsibility and Sustainability Committee discuss climate change in the context of Risk Management and Corporate Responsibility.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives	The Company's Chief Risk Officer regularly provides updates to the Board's Audit Committee regarding risk management (which incorporates climate change/environmental matters) at each meeting and the full Board receives a related report from the Company's Chief Risk Officer at least annually. As further discussed on page 1 of the Company's 2019 proxy statement, the Board's Compensation Committee approved "Operational Linkage" (that includes an environmental component) as a short-term incentive program (STIP) performance metric for certain executive officers. The status of this STIP performance metric is regularly reported to the Board and the Board's Finance Committee. The Board's Corporate Governance, Sustainability and Corporate Responsibility Committee oversees corporate citizenship practices including environmental, social and governance ("ESG") and sustainability initiatives. As further discussed on page 15 of the

	Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	Company's 2019 proxy statement, in recruiting and selecting Board candidates, the Board's Corporate Governance, Sustainability and Corporate Responsibility Committee considers a "skills matrix" to determine whether those skills and/or other attributes qualify candidates for service on the Board. The attributes, experiences, qualifications and skills considered in accordance with Corporate Governance Policies and the Corporate Governance, Sustainability and Corporate Responsibility Committee charter for each director nominee allows the Board to determine if the nominee is qualified to serve on FirstEnergy's board.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other, please specify Senior Vice President, Strategy	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Other, please specify Vice President, Risks & Internal Audit	Assessing climate-related risks and opportunities	More frequently than quarterly
Corporate responsibility committee	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

FirstEnergy's President and Chief Executive Officer is responsible for management of climate-related issues for the company, and our Board of Directors provides oversight. Senior company executives provide regular updates with the Board and relevant Board committees on topics related to climate issues, including business strategy, legislative and regulatory policies and climate initiatives. FirstEnergy's Senior Vice President, Strategy reports to the CEO and is responsible for overseeing the company's corporate responsibility strategy. The Strategy organization includes a dedicated staff who are focused on the companies environmental,

social, governance (ESG) and corporate responsibility initiatives, including climate risks and opportunities.
FirstEnergy's Vice President, Risk & Internal Audit, reports to the Senior Vice President and Chief Financial Officer. The Risk and Internal Audit teams have an established process for continuous review of risks and governance processes to effectively manage risks. The process is supported by FirstEnergy leadership, the Board of Directors and the Board's Audit and Finance Committees.
The Senior Vice President, Strategy leads the Corporate Responsibility Committee. This committee is a cross-functional, executive-level steering committee dedicated that was established to review and guide governance topics, including risks and opportunities associated with the climate. The team includes FirstEnergy's Chief Ethics Officer and Corporate Secretary, VP Risk & Internal Audit, VP of Corporate Affairs & Community Involvement, VP Investor Relations, Chief Human Relations Officer, and Vice President Utility Services (which includes Environmental). This team utilizes an internal development process in which a cross-functional team assesses and prioritizes potential initiatives and shares its recommendations with the Committee.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Other, please specify

Environmental Excursions and NOVs

Comment

FirstEnergy's compensation program is based on the fundamental premise of Pay for Performance, this includes base pay and incentive pay. FirstEnergy offers short-term incentive programs (STIP) to reward outstanding performance and achievement of business goals. FirstEnergy 's business goals include achieving financial goals as well as operational goals. Achieving financial goals are predicated upon successful execution of FirstEnergy's operations. FirstEnergy employee's compensation under our STIP is directly impacted by the number of environmental excursions - either

independently or as one of six components in our Operations Index for 2019. Environmental Excursions and notice of violation's (NOV) is one of our Key Performance Indicators and includes all regulatory reportable air emissions, water discharges or other unauthorized releases that exceed the allowable limitations, conditions or deadline established in the facilities' environmental permits and all NOV's issued by a Federal, State or Local Regulatory Agency for the violation of an environmental law or regulation.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	FirstEnergy's short-term horizons are considered to be within one year.
Medium-term	1	3	FirstEnergy's medium-term horizons are considered to be from 1-3 years.
Long-term	3	5	FirstEnergy's long-term horizons are considered to be from 3-5, or more years.

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	We operate in a business environment that involves significant risks, many of which are beyond our control. Management of each Registrant regularly evaluates the most significant risks of the Registrant's businesses and

			reviews those risks with the FirstEnergy Board of Directors or appropriate Committees of such Board.

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

A formal, comprehensive enterprise-wide risk management (EWRM) program is in place to ensure FirstEnergy thoroughly assesses and addresses risks and opportunities that could impact its electric system, including those posed by changes in the climate. These risks are assessed on a short- (0-1 years), medium- (1-3 years), and long-term (3-5 years and beyond) basis, with emphasis on long-term planning for potential climate-related issues. The EWRM's framework identifies individual risks at the enterprise, business unit or project level and groups them into four main categories (strategic, operational, compliance and financial), all of which have potential ties to climate.

Strategic risks: that could affect FirstEnergy's ability to achieve long-term business goals and objectives

Operational risks: that could challenge the safe, reliable operation of the transmission and distribution network

Compliance risks: that involve regulatory and legal issues

Financial risks: that could impact the company's earnings, debt, credit or reporting requirements

Risks that could impact the business more than five years in the future are evaluated and analyzed to understand the potential long-term impacts of identified strategic programs. The enterprise risk management (ERM) group works closely with the business units to identify emerging risks that could have an impact on our financial results. ERM facilitates risk workshops as needed to provide stakeholders with a forum to discuss operations, objectives, challenges and risks including, but not limited to, new products and services. Risk workshops are held with key stakeholders at both the discovery phase as well as the development phase. ERM conducts bow tie analysis to understand the drivers of emerging risks, recognize the potential consequences or impacts, and identify the appropriate mitigation strategy. As more information becomes available, ERM works with the business unit to strengthen the mitigation plan as necessary to minimize the impact on the business. Once vetted, these programs are reviewed with senior management, rolled out and continuously monitored for risks, opportunities and impacts. By understanding the full range of potential events, we can position FirstEnergy to seize growth opportunities through new value-added products and services, invest in our infrastructure to better serve customers and properly align our operations as a regulated utility.

To help facilitate reporting, identified risks are placed into sub-categories such as environmental, social, governance and sustainability. Two keys to the successful integration of the EWRM are understanding the risks that may prevent the achievement of goals and objectives and using the strengths of the organization to pursue opportunities to improve results and maximize shareholder value.

In addition, in April 2019, FirstEnergy published a climate report that includes the analysis of a 2-degree Celsius global climate scenario and the possible effect on FirstEnergy. Through our evaluation of a 2DS, we have envisioned an ambitious reduction in economy-wide carbon

emissions over the next several decades. We have studied the implications of this scenario on our five-state service area to better understand the risks and opportunities to our business. While this scenario is not used as a part of our current planning forecast, we are confident that we are already well-positioned to mitigate those risks, and we are exploring and acting upon many of the related opportunities that can benefit our shareholders, customers and communities. These actions include the continued implementation of our Corporate Responsibility, Emerging Technologies, Regulated Generation, and Transmission and Distribution strategies. The insights gained from this scenario will help inform our strategic planning process.

C2.2c

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	FirstEnergy's Regulatory Compliance and Reporting department regularly monitors and reports on the utility commissions' regulations in the states in which we operate (Ohio, Pennsylvania, New Jersey, West Virginia, Maryland, and New York) to eliminate the risk of non-compliance. In addition, FirstEnergy's Environmental, External Affairs, and Legal Departments specifically monitors USEPA's regulations such as Section 316(b) of the Clean Water Act, as this could be impactful to FirstEnergy's generation fleet that utilize cooling water towers for water intake, including our 3082 MW of regulated scrubbed coal in WV (Fort Martin Power Plant, Harrison Power Plant) and 1300 MW of competitive generation in WV (Pleasants Power Plant). Potential risks are communicated to ERM.
Emerging regulation	Relevant, always included	FirstEnergy's Environmental, External Affairs, and Legal Departments continuously monitor emerging regulations such as the Clean Power Plan. This emerging regulation could be impactful to FirstEnergy's generation fleet, including our 3082 MW of regulated scrubbed coal in WV (Fort Martin Power Plant, Harrison Power Plant), and 1300 MW of competitive generation in WV (Pleasants Power Plant). At a minimum, emerging risks are reviewed by the ERM team during a formal semi-annual risk interview process. Potential risks are communicated to ERM.
Technology	Relevant, always included	Technology in the energy space continues to develop and change and the electric grid needs to be able to accommodate the change. Since 2010, FE has constructed and studied Smart Grid technology through pilot projects in Ohio, Pennsylvania, and New Jersey. These improvements have produced quantifiable improvements in reliability and resiliency. FE continues to monitor and study the evolution of technology and adapt in ways that will benefit our customers. We partner with industry experts, DOE, Universities, and EPRI to guide

		our analyses and modernization efforts. In 2017, the Emerging Technologies Roadmap was developed to address how best to integrate new technologies. For example, FirstEnergy is part of pilot studies/programs involving energy storage, microgrids, and electric vehicles. FirstEnergy is currently performing a detailed update of the roadmap and plans to annually review the roadmap.
Legal	Relevant, always included	FirstEnergy's Legal Department actively monitors changes and/or additions to Federal and/or State laws and regulations for the areas in which we operate (Federal – United States; States - Ohio, Pennsylvania, New Jersey, West Virginia, Maryland, and New York). For example, FirstEnergy Legal regularly updates ERM on potential litigation risk associated with environmental laws for the costs of remediating environmental contamination of property now or formerly owned by FE, and of property contaminated by hazardous substances. This includes Manufactured Gas Plant (MGP) related litigations, particularly in New Jersey.
Market	Relevant, always included	Monitoring of market and commodity prices is relevant and always included – including monitoring of NOx and SOx markets. FirstEnergy's Environmental department, among others, continuously monitors and discuss NOx and SOx markets, and existing and emerging regulations to assess potential impact to our regulated scrubbed coal fleet (Harrison and Fort Martin), and our competitive generation plant (Pleasants).
Reputation	Relevant, always included	FirstEnergy takes reputation risk very seriously across all facets of the organization. As an example, FirstEnergy's Environmental, Transmission and Utility Operations work together to ensure compliance with environmental laws and regulations, including those related to the Endangered Species Act. There are numerous species that are State and/or Federally listed as threatened or endangered species within the region of the United States in which we operate (i.e. the northern long-eared bat). As FirstEnergy plans for and executes projects we work to ensure protection of these species. While this not only provides compliance with environmental laws and regulations, it also provides benefit to the environment, and reduces risk to our reputation.
Acute physical	Relevant, always included	The requirements for the National Pollutant Discharge Elimination System (NPDES) is an example of an acute physical risk. This includes the environmental compliance cost of future air water or waste regulations. FirstEnergy is currently working with industry and the EPA to reduce potential costs. FirstEnergy representatives have met with key states and they have agreed to work with us on deadlines. The more time we have the more alternatives we can review.

Chronic physical	Relevant, always included	The Clean Power Plan (CPP) is an example of a chronic physical risk. In August 2015 the Obama administration enacted the CPP with its specific requirement being to reduce carbon pollution from power plants. In 2017 the Trump administration issued a proposal to repeal the CPP and on June 19, 2019 the EPA issued the final Affordable Clean Energy (ACE) rule. ACE was designed to provide existing coal-fired electric utility generating units with achievable and realistic standards for reducing greenhouse gas emissions. We continue to work with the industry on our strategy and options to the new rule making.
Upstream	Relevant, always included	Emerging Technologies is an example of identified upstream risks. Strategy, construction, design, and the enterprise risk management (ERM) team work together to determine programs that will have the greatest impacts, risks, and opportunities. Regular updates and associated risks are provided to ERM during regular update meetings and/or the semi-annual risk interview process.
Downstream	Relevant, always included	FirstEnergy's Environmental, External Affairs, and Legal Departments continuously monitor emerging regulations such as the Clean Power Plan. This emerging regulation could be impactful to FirstEnergy's generation fleet, including our 3082 MW of regulated scrubbed coal in WV (Fort Martin Power Plant, Harrison Power Plant), and 1300 MW of competitive generation in WV (Pleasants Power Plant). At a minimum, emerging risks are reviewed by the Enterprise Risk Management (ERM) team during a formal semi-annual risk interview process. Potential risks are communicated to ERM.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

FirstEnergy’s Risk Management group works collaboratively with the Internal Auditing department to establish a continuous review of risks and governance processes to effectively manage risks. The process utilizes a single-risk universe of our company to engage key stakeholders and subject matter experts in an ongoing dialogue regarding risks. Risks are assessed for materiality to determine their likelihood, the potential impact on earnings or cash flow, and anticipated timing and effectiveness of the current mitigation plan. This assessment helps us prioritize our response to each risk and capitalize on opportunities to maximize shareholder value. When appropriate, detailed mitigation plans are developed, implemented and regularly reviewed to measure progress.

The enterprise wide risk management (EWRM) process and oversight of risk management is supported by FirstEnergy leadership, the Board of Directors and the Board’s Audit and Finance Committees. Risks are presented to these committees on a short- and long-term basis to increase the transparency of the risks and allow each committee to play an active role in the oversight process. In addition, all risks and opportunities are reviewed to ensure alignment with strategic goals.

A large component of our EWRM addresses severe weather events, threats such as electromagnetic pulses, geomagnetic disturbances and other significant occurrences in our service territories. We continually forecast, monitor and plan for emergency situations that could impact our ability to deliver power to our customers. When significant outages occur, we rely on the industry's Mutual Assistance Network – a voluntary partnership of electric companies from across the country – to help restore power to our customers as quickly and safely as possible. We have developed an extensive Internal Emergency Response Organization, which incorporates key principles and concepts of the National Incident Management System. The Incident Command System is fully structured and deployed throughout FirstEnergy, and all functional areas conduct internal exercises at least annually to test key systems, processes and training.
We also participate in working groups, training opportunities and conferences at all levels of the public and private sectors to ensure operational readiness, build key relationships, stay abreast of technological advancements, and openly share processes and lessons learned from our after-action review process. We devote considerable time and resources to developing plans to meet physical and cyber-security threats. Among other measures, we are hardening our facilities and evaluating and testing our physical and cyber disaster response plans and processes to ensure maximum readiness against these potential attacks. We evaluate threats to our system's communications network by employing Threat Intelligence Management to detect and enhance responses to cyberattacks. This approach improves our ability to work with our government partners to enhance system security and the resilience of critical infrastructure.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

FirstEnergy recently conducted a two-degree scenario analysis as a part of our climate report. This scenario described dramatic change in the 6 states in which FirstEnergy operations (Ohio, West Virginia, Pennsylvania, New Jersey, Maryland, and New York). The anticipated scale and pace of those changes present a risk to our transmission and distribution system that consists of more than 277,000 miles of distribution lines, and approximately 25,000 miles of transmission lines, as well as our more than 6 million customers. As a fully regulated utility, the implications to FirstEnergy of the changes outlined in the scenario analysis present strategic risks since the ability to implement the required charges are dependent on future public policy and regulatory decisions that would allow for regulated utilities to own renewable generation and electric vehicle charging stations. Federal and state regulatory frameworks would need to adapt to the changing market, operational and technological conditions to achieve the decarbonization described in the scenario. These changes would necessitate market reforms and pricing mechanisms that create financial incentives to integrate renewable generation, incentive retirements of fossil plants and support expansion of the transmission grid. Policy and regulatory reforms would be needed at an accelerated pace to ensure regulated utilities have enough resources to provide safe, reliable and affordable service that is responsive to customer preference.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

FirstEnergy cannot currently estimate the financial impact of climate change policies, although they could have a negative impact on FirstEnergy's revenues and operations.

Management method

To manage this risk, we actively engage with federal and state legislators, regulators, customers and other stakeholders to facilitate an open and constructive dialogue on changing market conditions and appropriate measures required to maintain high-quality service for our customers. With our transition to a fully-regulated utility company, we are well-positioned to respond to and fulfill evolving customer preference. For example, residential and commercial customers can make use of our new value-added products and services that can help them save energy and improve the quality of their lives. For instance, customers with smart meters can access our Energy Analyzer Tool on their smartphones to view energy consumption data. The tool provides energy saving tips and data that can help them better understand their energy usage and manage their monthly electric bills.
In addition, we work with state and federal policymakers to educate and advance FirstEnergy's position on legislative and regulatory proposals that shape FirstEnergy's future. Policymakers who understand our vision, mission and strategies can help support our efforts toward a brighter energy future.

Cost of management

0

Comment

The cost of management of climate-related policy and legal risks are incorporated in our business plan.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Technology: Substitution of existing products and services with lower emissions options

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

The scenario analysis FirstEnergy conducted envisions a future with widespread electrification, including extensive use of electric vehicles and widespread conversion to heat pumps in residential, commercial and industrial buildings. This increase would result in the need to accommodate dramatic increases in load during peak and non-peak hours, thereby potentially causing an operational risk to the transmission and distribution system. In a highly electrified economy such as the one described in the

scenario analysis, the loss of power would not just mean loss of lighting and refrigeration; it would also mean losing the ability to heat homes and businesses, power transportation and communication systems, and operate water and sewage pumps. According to FirstEnergy's analysis, transportation load on the electric system increases from virtually zero today to more than 95 million MWh per year by 2050 across the six-state region (Ohio, Pennsylvania, New Jersey, Maryland, West Virginia, and New York) where we operate. To put that in perspective, 95 million MWh represents an approximately 20 percent increase over total current electric consumption within the region.

Time horizon

Long-term

Likelihood

Likely

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

FirstEnergy cannot currently estimate the financial impact of operational risks, however they could cause increased costs to our company and our customer.

Management method

As part of our management method of this risk, FirstEnergy's Energizing the Future transmission investment program and comparable improvements on the distribution system are critical to providing a more flexible system that can respond to the continually changing demand and power flows on the system. From 2014 to 2018, we invested nearly $5.6 billion on grid improvement projects, and we are on track to invest approximately $1.2 billion per year on our transmission system from 2019-2021. Of the $1.2 billion per year, we expect over 75 percent of the investment to go toward enhancing grid reliability. Looking beyond 2021, we have identified more than $20 billion in additional projects designed to help us meet the evolving energy needs of our customers, ensure service reliability into the future, add resiliency to our transmission system, meet potential future load growth in our service area, and increase physical and cyber security.

FirstEnergy will continue to work with developers, researchers and policymakers to

better understand these risks and help advance new technologies that are critical to the effective and efficient operation of the changing transmission and distribution system. Our ability to sustain reliable and resilient electric service is critical to our region's economic success and security. It also will be critical to building a low-carbon energy infrastructure.

Cost of management

0

Comment

The costs of this climate-related risk are part of existing management practices.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Market: Other

Type of financial impact

Reduced demand for goods and/or services due to shift in consumer preferences

Company- specific description

In 2018, FirstEnergy was subject to a number of Energy Efficiency (EE) and/or Peak Demand Reduction (PDR) requirements in Maryland, Ohio, Pennsylvania, and West Virginia. Legislation in Maryland and Ohio set eventual targets of 2% annual incremental energy efficiency savings, while Pennsylvania and West Virginia have lesser goals. These requirements direct FirstEnergy to provide energy efficiency and peak demand reduction portfolios with multiple programs and hundreds of measures (covering residential, commercial and industrial offerings, and all major electric end uses, e.g. HVAC equipment, lighting technologies, building measures, behavioral programs, commercial and industrial equipment, etc.) that enable customers to reduce electric consumption and peak demand impact. These programs reduce FirstEnergy Distribution, Transmission, and Generation sales and revenues. Failure to achieve these EE/PDR requirements may subject FirstEnergy to significant financial penalties, or strain relationships with regulators and stakeholders. While regulatory approval for the Companies' West Virginia energy efficiency portfolio ended in 2018 and will not be available in future years, EE/PDR requirements and associated portfolios continue in Maryland, Ohio, and Pennsylvania in 2019. The Company is also expected to be subject to EE/PDR requirements in New Jersey starting in 2020 that will increase to a goal of 2% annual incremental energy efficiency savings per year.

Time horizon

Short-term

Likelihood

Exceptionally unlikely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

140,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

FirstEnergy spent approximately $162 million during 2018 on its portfolios that were created in response to state Energy Efficiency and Peak Demand Reduction requirements. These costs were approved by regulatory bodies and have associated cost recovery mechanisms. Failure to meet state targets may subject the Company to financial penalties that vary by jurisdiction of up to $20 million per offense (max potential is $140 million). Additionally, FirstEnergy's distribution revenues in certain jurisdictions will be lower as a result of reduced usage arising from its Energy Efficiency and Peak Demand Reduction programs.

Management method

FirstEnergy developed a dedicated Energy Efficiency department that manages all programs in response to state requirements. In 2018, this department conducted monthly progress reviews and forecasted performance against these targets. FirstEnergy utility programs have a strong track record of meeting or significantly exceeding state targets. In 2018, the FirstEnergy companies produced energy efficiency savings of approximately 1,627,000 MWh, approximately 99,000 MWh in MD, 903,000 MWh in OH, 599,000 MWh in PA, and 26,000 MWh in WV . FirstEnergy's energy efficiency programs help customers invest in energy efficient equipment and gain insight into their energy usage. In 2018, FirstEnergy's behavioral energy efficiency programs delivered over 5,400,000 print and email home energy usage reports to approximately 790,000 customers. By highlighting customers' energy usage characteristics and providing energy savings tips, these programs saved approximately 183,000 MWh.

Cost of management

0

Comment

Ohio regulatory structure also has revenue recovery mechanisms offsetting the impacts of reduced distribution sales. In other jurisdictions, revenue impacts based on Energy Efficiency and Peak Demand Reduction programs can only be adjusted during base rate case proceedings. While the prospect of FirstEnergy being fined the full $140 million is exceptionally unlikely, the revenue reduction in certain jurisdictions arising from its EE/PDR programs is virtually certain until such times as such Operating Companies would hold a base rate case.

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Shift toward decentralized energy generation

Type of financial impact

Other, please specify

Increased revenue through new products

Company-specific description

FirstEnergy views distributed energy resources (DERs) as a potential opportunity associated with climate change. FirstEnergy supports our customers' right to safely DERs and has developed processes that support the interconnection of solar, energy storage and other DERs consistent with the laws and regulations of individual states. FirstEnergy also supports use of DERs in emergency situations for critical facilities. When sited at optimal locations and owned and operated by the electric utility, distributed energy resources provide benefits to the distribution grid such as reducing peak load, providing voltage support, improving reliability and resiliency, and reducing line losses. DERs also can be a key component for utilities to enable emerging

technologies, including utility scale solar, microgrids, energy storage projects and electric vehicles. To maximize the locational net benefit of DERs, utilities are in the best position to ensure their safety and reliability for the benefit of customers on the distribution grid.

Time horizon

Medium-term

Likelihood

More likely than not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

FirstEnergy cannot currently estimate the financial impacts of this opportunity.

Strategy to realize opportunity

FirstEnergy is exploring opportunities that will result from the growing adoption of distributed generation resources such as rooftop solar, electrification, and battery storage. For example, FirstEnergy was part of a three-year collaborative research project funded by the Department of Energy's (DOE) SunShot Initiative to develop solar energy storage and a more secure and resilient electrical grid. The funding was awarded under the DOE Sustainable and Holistic Integration of Energy Storage and Solar PV, or SHINES, program. Led by the electric power research institute (EPRI), the project team also includes Case Western Reserve University, industrial companies and other utilities. As part of this project, researchers will investigate how to transform the design and operation of the electric power system to seamlessly integrate photovoltaic resources, load management and energy storage systems.

Cost to realize opportunity

Comment

FirstEnergy cannot currently estimate the costs to realize this opportunity.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resilience

Primary climate-related opportunity driver

Participation in renewable energy programs and adoption of energy-efficiency measures

Type of financial impact

Other, please specify

New products/business services

Company-specific description

Our utility operating companies helped customers better manage their energy use through the energy efficiency programs they offered via EnergySave Maryland, EnergySave Ohio, EnergySave Pennsylvania, and EnergySave West Virginia. These programs also played a key role in helping the companies meet state mandates for energy efficiency. Our operating companies offered a portfolio of programs for residential, commercial and industrial customers. Our programs for residential customers included discounted compact fluorescent light and LED bulbs; rebates on the purchase of new, efficient appliances and products; rebates on the cost of home energy audits and heating, ventilation and air conditioning replacements; incentives to recycle older, less efficient refrigerators, freezers and room air conditioners; home energy usage reports and energy efficiency kits; and targeted programs for low-income customers. Our programs for commercial and industrial customers provided incentives to install efficient lighting, HVAC motors, drives and other energy-efficient equipment and processes.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

10,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

FirstEnergy's Ohio operating companies have the potential to earn financial incentives of up to $10 million after tax per year based on Energy Efficiency program performance, and an additional 20% of revenues for managing Energy Efficiency and Demand Response resources borne from the companies' Energy Efficiency program in PJM Base Residual Auctions.

Strategy to realize opportunity

FirstEnergy is committed to our mission of making our customers' lives brighter, the environment better and our communities stronger. To support this, FirstEnergy continues to maintain a dedicated Energy Efficiency department offering energy savings programs with the goal of surpassing energy efficiency targets set by states and regulatory agencies. FirstEnergy's Energy Efficiency department conducted monthly progress reviews and forecasted performance of energy efficiency programs. As a result of these activities, the FirstEnergy Ohio operating companies were able to earn $10 million based on the amount of net benefits delivered to its customers through energy efficiency programs.

Cost to realize opportunity

Comment

FirstEnergy cannot currently estimate the costs to realize this opportunity.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Shift toward decentralized energy generation

Type of financial impact

Other, please specify

Increased Revenue through new products

Company-specific description

FirstEnergy recently conducted a two-degree scenario analysis as part of our climate report. The scenario presents a situation in which there is a transition to a lower carbon

electric grid. This future presents significant opportunities for FirstEnergy. For example, the scenario analysis requires rapid and widespread electrification of end-use technologies, including a large number of electric vehicles. Consistent with the goal to reduce economywide emissions, we support moving forward with transportation electrification. However, it is important that there is electric distribution company engagement from the beginning of this transition. Regulated electric utilities like FirstEnergy are well-positioned to offer public charging services for electric vehicles because utilities can best plan and manage regular maintenance and upkeep to avoid long plug-in electronic vehicles (PEV) service equipment downtime, optimize charging retail rates and plan for long-term infrastructure rollouts that are not subject to short-term profitability goals. Utilities also can identify PEV charging station sites in optimal locations across the service territory, considering low-income and disadvantaged neighborhoods, travel corridors – which can help induce tourism – and optimal placement for grid interconnections.
Electric utility support for electric vehicle adoption, charging infrastructure and the efficient use of electricity will yield tremendous environmental benefits, including significant CO2 reductions, by lowering emissions from transportation fuels.

Time horizon

Medium-term

Likelihood

More likely than not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

900,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

FirstEnergy has included CAPEX in it's future years budgets for EV charging stations in our Potomac Edison operating company, located in Maryland.

Strategy to realize opportunity

We will continue to research opportunities to support electrification of the transportation sector. For example, in Maryland, our Potomac Edison utility received approval to establish a utility pilot program featuring rebate and PEV charging infrastructure offerings. The programs will include customer and company-owned charging stations and customer outreach components.

Cost to realize opportunity

Comment

FirstEnergy cannot currently estimate the costs to realize this opportunity.

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	FirstEnergy's Risk Management group proactively works with stakeholders to minimize risks and maximize opportunities associated with new and existing products and services. This process remains the same regardless if the product/services are climate related or not. Risk workshops are held with key stakeholders for each product and/or service at the discovery phase as well as the development phase. At the discovery phase, a risk register is built out with identified risks/opportunities, quantified to the extent possible, and associated mitigation strategies and/or pivots are identified. This is an iterative process and is continually updated as information is received. In the development phase, additional risks/opportunities and/or new risks/opportunities (if product has pivoted) are identified, measured and have developed mitigation strategies documented. Enterprise risk management will provide a final recommendation per the review of the results of each workshop that is presented to executive management for signoff.
Supply chain and/or value chain	Impacted	FirstEnergy's Risk Management group proactively works with stakeholders to minimize risks and maximize opportunities associated with climate change. Uncertainty presents both risk and opportunity which is why it is essential all stakeholders be involved in the identification of risks as we seize opportunities to maximize value. By understanding the full range of potential events, we are able to identify risk responses and seize growth opportunities by offering new value-added products and services, investing in our infrastructure, and re-aligning our operations as a regulated utility. Given FirstEnergy is a larger purchaser, we have the ability to influence the move toward more sustainable supply chain practices by taking into account environmental and social risks and benefits with our suppliers. Through our procurement decisions, we continuously work to create efficiencies and improve environmental and safety performance by collaborating with our suppliers to maintain the highest quality standards while minimizing their impacts on natural resources. In addition, we value supplier diversity in all aspects of our business and supply chain practices. For example, we connect certified, diverse businesses with opportunities to provide goods and services at

		FirstEnergy. By working to align these businesses with our company's culture, we are supporting long-term business growth while sharing of vision of inclusiveness. Having diversified business relationships enhances competition that will ultimately increase innovative products and services that improves reliability and lowers costs for everyone. In addition, the credit risk management department maintains a Supply Chain Top Vendor Report and Summary which is updated quarterly. This report details FirstEnergy's top vendors company-wide including such information as vendor name, buyer, workgroup, industry type, annual spend, credit rating, and comments from both Credit Risk and the buyer. This report is presented at a quarterly meeting with Supply Chain representatives and management. Energy Efficiency vendors are highlighted to distinguish these vendors on the report.
Adaptation and mitigation activities	Impacted	A collaborative effort by Enterprise Risk Management (ERM) and Internal Audit (IA) has established a continuous review of risks and governance processes to assist the Company in achieving its objectives by effectively managing risks. This is an iterative process by which ERM and IA bi-annually interview the businesses to identify risks/opportunities and associated mitigation plans. IA then audits those mitigation plans to ensure their effectiveness. In the event a mitigation strategy is considered inefficient, IA and ERM will work with the business to strengthen the mitigation plan. This information is captured in the ERM database which is the system of record for all risks.
Investment in R&D	Impacted	FirstEnergy's Risk Management group proactively works with stakeholders to minimize risks and maximize opportunities associated with climate change. Similar to the product and services approach, Risk Workshops are held with key stakeholders for each R&D initiative. For example: The use of GORE Technology Workshops begins with the identification of all risks around investing in a new and unproven technology. Bowtie analysis are performed to identify threats and consequences. All available analytics are reviewed to determine mitigation strategies along with ERMs recommendations around the associated residual risks. This information is packaged into a Risk Assessment document to be reviewed by executive management for decision making purposes.
Operations	Impacted	FirstEnergy's Risk Management group proactively works with stakeholders to minimize risks and maximize opportunities associated with climate change. Uncertainty presents both risk and opportunity which is why it is essential all stakeholders be involved in the identification of risks as we seize opportunities to maximize value. By understanding the full range of potential events, we are able to identify risk responses and seize growth opportunities by offering new value-added products and services, investing in our infrastructure, and re-aligning our operations as a regulated utility. From an operational perspective, risks are reviewed using a top down and bottom up approach.

		Top down: The strategic plan at the corporate level has a risk assessment performed annually with risks being analyzed both at the inherent and residual level for financial implications. Bottom up: The business unit performs project level risk assessments to ensure goals and objectives are achievable. All risks and opportunities are reviewed to ensure alignment with strategic level goals.
Other, please specify		

C2.6

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	FirstEnergy's Risk Management group partners with FirstEnergy's Finance group in the company's annual budget planning initiative. The objective of this initiative is to develop a formal governance and oversight structure and process which defines accountability and ownership. The initiative will establish a standard and formal process for communicating the financial plan to ensure alignment across the organization – specifically with Operations, Rates, Strategy, and Finance. FirstEnergy's Risk Management group proactively maintains, and continually improves, a Consolidated Financial Risk Model. This model looks at variables outside of FirstEnergy management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events, such as Hurricane Sandy, are not included in the modelling, but are reported through our low probability, high impact risk reporting. In addition to the risk model, risk impacts on revenues are continuously reviewed with all FirstEnergy utilities, environmental, generation, transmission, distribution and corporate strategy departments. Risk Management is involved in the annual review of the strategic plan and quarterly re-forecasts. In addition, a risk analysis is conducted each year on key performance indicators.
Operating costs	Impacted	FirstEnergy's Risk Management group performs an annual risk assessment on the company's budget results summary prior to the summary being presented to the Finance Committee. This assessment includes a comprehensive review of reported operating costs and any material fluctuations from prior years. FirstEnergy 's Risk Management group proactively maintains,

		and continually improves, a Consolidated Financial Risk Model. This model looks at variables outside of FirstEnergy management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events, such as Hurricane Sandy, are not included in the modelling, but are reported through our low probability, high impact risk reporting. In addition to the risk model, risk impacts on operating costs are continuously reviewed with all FirstEnergy utilities, environmental, generation, transmission, distribution and corporate strategy departments. Risk Management is involved in the annual review of the strategic plan and quarterly re-forecasts. In addition, a risk analysis is conducted each year on key performance indicators.
Capital expenditures / capital allocation	Impacted	FirstEnergy's Risk Management group proactively maintains, and continually improves, a Consolidated Financial Risk Model. This model looks at variables outside of FirstEnergy management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events are not included in the modelling, but are reported through our low probability, high impact risk reporting. For example, the risk includes the costs associated with capital for repairs and/or restorations from storm damage in a year that has an extreme event, such as Hurricane Sandy. This risk is mitigated by building up a more resilient infrastructure; by accelerating rate case plans; purchasing adequate insurance and maintaining enough liquidity to cover capital costs. Capital expenditures/allocation is managed at the project level with budget oversight at the business unit level. All large capital projects are required to have a detailed risk assessment. Risks at the project level are usually updated, reported on and discussed monthly. Projects that have had deep dive risk assessment include, but are not limited to Mercury Air Toxics Standards Implementation, Smart Meter/Smart Grid and Energy Efficiency.
Acquisitions and divestments	We have not identified any risks or opportunities	FirstEnergy's Risk Management group has not identified any acquisitions and/or divestments as risks or opportunities.
Access to capital	Impacted	FirstEnergy's Risk Management group proactively maintains, and continually improves, a Consolidated Financial Risk Model. This model looks at variables outside of FirstEnergy

		management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events, such as Hurricane Sandy, are not included in the modeling, but are reporting through our low probability, high impact risk reporting. Results of the model and other risks are reviewed with Treasury (especially major risks are reviewed bi-monthly) to understand the impacts to cash flow and liquidity. Treasury then monitors access to capital markets to ensure we have adequate liquidity to fulfill our needs.
Assets	Impacted	FirstEnergy's Risk Management group proactively maintains, and continually improves, a Consolidated Financial Risk Model. This model looks at variables outside of FirstEnergy management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events, such as Hurricane Sandy, are not included in the modelling but are reported through our low probability, high impact risk reporting. Risk impacts on assets and liabilities are continuously monitored by FirstEnergy, all FirstEnergy utilities, our environmental, generation, transmission and distribution business departments, Treasury and Corporate Strategy as we work to strengthen our balance sheet. Scenarios are run to understand the impacts on the balance sheet before the financial planning process is complete.
Liabilities	Impacted	FirstEnergy's Risk Management group proactively maintains, and continually improves, a Consolidated Financial Risk Model. This model looks at variables outside of FirstEnergy management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events, such as Hurricane Sandy, are not included in the modeling, but are reported through our low probability, high impact risk reporting. Risk impacts on assets and liabilities are continuously monitored by FirstEnergy, all FirstEnergy utilities, our environmental, generation, transmission and distribution business departments, Treasury, and Corporate Strategy as we work to strengthen our balance sheet. Scenarios are run to understand the impacts on the balance sheet before the financial planning process is complete.
Other	Impacted	FirstEnergy's Risk Management group proactively maintains, and continually improves, a Consolidated Financial Risk Model.

		This model looks at variables outside of FirstEnergy management's control, and the potential financial impact (i.e. impacts to the income statement, balance sheet, cash statement). The model looks at the range of possibilities between the 2nd percentile and 98th percentile. Extreme events, such as Hurricane Sandy, are not included in the modeling, but are reported through our low probability, high impact risk reporting. "Other" areas included are: Interest Expense and Trusts (Pension, OPEB, NDT). The enterprise work management department (ERM) works closely with the business units to identify other risks that may be emerging that could have an impact on our financial results. ERM will conduct risk workshops to bow tie analysis to understand the drivers to risks, the potential consequences/impacts and to identify the appropriate mitigation strategy. As more information becomes available, ERM will work with the business unit to strengthen the mitigation plan as necessary to minimalize impacts on the financial process.

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative and quantitative

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

Yes

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

FirstEnergy has made a significant shift in our corporate strategy over the past several years. FirstEnergy is now a fully regulated utility company, focused primarily on our transmission, distribution, and remaining regulated generation business. This strategy enables us to align our focus with market and technology trends and consider opportunities that support a lower-carbon future and our customers' expectations. The following discussion highlights key elements of our strategy as it relates to climate-related risks and opportunities.

Transmission: FirstEnergy's transmission system is an essential part of our work to build a reliable, more resilient and lower-carbon grid. Through our *Energizing the Future* program, we are upgrading and modernizing our transmission system to ensure customers benefit from a smarter, stronger and more secure power grid for years to come.

Since launching *Energizing the Future* in 2014, FirstEnergy has completed 600 to 700 projects per year focused on three main areas of investment: upgrading or replacing aging equipment to harden our transmission infrastructure, reduce outages and cut maintenance costs; enhancing system performance through technology upgrades; and building redundancy and adding operational flexibility that enables our grid operators to more swiftly respond to changing grid conditions. Together, these projects are producing measurable results for customers, including a 37 percent reduction in equipment-related outages on the transmission system serving The Illuminating Company, Ohio Edison and Toledo Edison utilities in Ohio, as well as our Penn Power service area in western Pennsylvania.

Distribution: Our distribution business strategy is focused on building a more dynamic, intelligent and secure network that will change the way energy is delivered and provide additional opportunities for enhancing our customer-focused services. Toward that end, we're investing in projects intended to create a more resilient, flexible distribution system, while evaluating new opportunities that enable emerging technologies, such as utility-scale solar, energy storage and electric vehicles, to modernize our distribution system and meet the future energy needs of our customers. We plan to invest up to $1.7 billion per year in our distribution operations from 2019 to 2021. Investments will go toward improving the reliability of the distribution system, creating smarter grid opportunities, and maintaining service and reliability performance.

Grid Modernization: We are focused on improving the reliability and resiliency of our distribution network through a significant grid modernization effort. Since 2010, we have constructed and studied smart grid technology through pilot projects in Ohio, Pennsylvania and New Jersey. These projects have produced quantifiable improvements in network reliability and resiliency. We have filed plans with regulators across our footprint to upgrade our grid with more demand-responsive and smart technologies.

Rebuilding our network as a smarter grid will require a sustained effort and significant investments in time and resources. However, we believe these technologies will help FirstEnergy meet the changing needs of the grid while we efficiently manage the delivery of power.

Customer Engagement: We remain committed to delivering safe, affordable, secure and reliable electric services that address the changing needs and expectations of our customers. Our grid modernization initiatives include opportunities to engage residential, commercial and

industrial customers. For example, our industrial customers can use FirstEnergy's Electric Advantage program to enhance their productivity and competitiveness while meeting sustainability goals using efficient electric products such as electric forklifts and infrared heating systems for drying products and coatings.

Emerging Technologies: We value our role as a trusted advisor to our customers and an ally in meeting their energy, sustainability and climate goals. For this reason and others, we formed an Emerging Technologies Strategy group in 2018. This new group is dedicated to exploring advanced technologies that benefit customers and support federal and state policy efforts to improve grid performance and energy security. Many of these technologies are also critical for supporting a lower-carbon electric system and reducing the carbon intensity of the overall economy through greater electrification. These technologies build on our existing regulated business platform while offering customers the flexibility and functionality they want.

Generation Fleet: As part of our transformation to a fully regulated utility, we have significantly reduced the size of our generation fleet. In most states where FirstEnergy operates, our utilities are not permitted to own wind or solar generation. However, we continue to support the option for utility-owned renewable generation that is located in our footprint, allowed by the state public utility commissions, recoverable through cost-of-service based rates and in the best interest of customers.

C3.1d

(C3.1d) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios	Details
2DS	In 2019 FirstEnergy published a climate report that included a two-degree scenerio analysis. The analysis is based on the International Energy Agency's 2DS (IEA 2DS). In selecting a scenario to study, our objective was to evaluate a 2DS with sufficient detail to provide meaningful insights for our business and geography. We also prioritized a publicly available analysis to promote greater transparency in the process. The structure of our analysis was guided by recommendations from the TCFD as well as a report published by Ceres and authored by MJ Bradley & Associates (MJB&A). We also took into consideration other third-party produced 2-degree scenarios, including "beyond 2-degree" scenarios that are consistent with an October 6, 2018, Special Report on Global Warming of 1.5°C from the Intergovernmental Panel on Climate Change. While the IEA 2DS publication provided a strong basis for this analysis, we engaged a consultant to develop state-level detail from the IEA 2DS for the six states where FirstEnergy primarily operates: OH, PA, WV, NJ, MD, and NY. The IEA 2DS envisions that a 90% reduction in multi-sector U.S. CO2 emissions by 2060, along with other reductions across the globe, would be necessary to limit global temperature rise to below 2 degrees Celsius. When applied to our operating states, the scenario results show significant changes in energy use across all sectors of the economy, with the largest contribution from electricity generation and transportation sectors.

	The electric generating fleet across our five-state region is almost completely restructured in the scenario. Renewables and other zero-carbon resources dominate the generation mix by 2050, accounting for almost 75% of electricity produced within the region. Nuclear generation accounts for almost 20% of generation followed by natural gas combined-cycle plants at 3% and coal with carbon capture and storage at 2%. All existing coal plants operating in the region (approximately 40,000 MW of capacity) are retired by 2035. Achieving this level of decarbonization would require a significant increase in utility-scale renewable energy projects with higher average capacity factors than are currently available, transmission expansions to access regions with better renewable resource potential and an increase in energy storage capacity. Through our evaluation of a 2DS, we have envisioned an ambitious reduction in economywide carbon emissions over the next several decades. We have studied the implications of this scenario on our five-state service area to better understand the risks and opportunities to our business. While this scenario is not used as a part of our current planning forecast, we are confident that we are already well-positioned to mitigate those risks, and we are exploring and acting upon many of the related opportunities that can benefit our shareholders, customers and communities. These actions include the continued implementation of our Corporate Responsibility, Emerging Technologies, Regulated Generation, and Transmission and Distribution strategies. The insights gained from this scenario will help inform our strategic planning process.

C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e

(C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e) Disclose details of your organization's low-carbon transition plan.

In 2015, we set an aggressive goal to reduce CO2 emissions by at least 90 percent below 2005 levels by 2045.

We have made significant progress toward achieving our CO2 emissions reduction goal.

By the end of 2018, we reduced CO2 emissions by 62 percent from our 2005 baseline, which represents a total reduction of about 59 million tons of emissions.

The 62 percent reduction was accomplished through various actions, including:

· retirement of 28 units at 12 coal-fired power plants with a total capacity of 5,753 MW

· retirement of six units at four oil or gas-fired power plants with a total capacity of 197 MW

· sale of 26 units at 10 oil and gas-fired power plants with a total capacity of 1,795 MW

· sale of one unit at a fossil fuel-fired plant with a total capacity of 136 MW

· lower generation output at remaining power plants due to market conditions

Upon FirstEnergy Solutions' emergence from bankruptcy, which is expected to be completed in 2019, FirstEnergy Solutions will be legally separated from FirstEnergy which will no longer be accountable for the emissions associated with three additional fossil fuel-fired generation

facilities, resulting in further reductions to FirstEnergy's CO2 emissions. At that time, we anticipate FirstEnergy's carbon emissions will be 80 percent below our 2005 baseline – placing us well ahead of schedule to achieve our goal of a 90 percent CO2 reduction by 2045.
We intend to continually evaluate our goals in relation to our regulated generation portfolio and assess opportunities to further reduce our related CO2 emissions, including analysis of our opportunities under integrated resource planning.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Absolute target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Scope

Scope 1

% emissions in Scope

99.72

Targeted % reduction from base year

62

Base year

2005

Start year

2015

Base year emissions covered by target (metric tons CO2e)

86,403,130

Target year

2045

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% of target achieved

62

Target status

Underway

Please explain

FirstEnergy's Scope 1 stationary emissions continue to decrease through the use of innovative technology and changes to fleet operations.

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0
Implementation commenced*	0	0
Implemented*	5	4
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative type

Other, please specify

Utility-scale fuel cell system

Description of initiative

Estimated annual CO2e savings (metric tonnes CO2e)

4

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

0

Investment required (unit currency – as specified in C0.4)

5,000,000

Payback period

4 - 10 years

Estimated lifetime of the initiative

Ongoing

Comment

This full-scale hydrogen fuel cell assessment demonstration project has been completed. Hydrogen fuel cells for large scale generation are still in the early stage of technology development. Presently, integration into a generation fleet is not cost effective.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	FirstEnergy supports research with EPRI, government agencies, and universities to identify and evaluate technologies which can reduce emissions and which can be cost effective in supplying power to our customers.
Dedicated budget for energy efficiency	Improvements are funded by membership in EPRI for research, and through established plant operating and capital improvement budgets.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Company-wide

Description of product/Group of products

Renewable energy

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

USEPA Avoided Emissions Calculator

% revenue from low carbon product(s) in the reporting year

Comment

Avoided emissions can be calculated based on the amount of renewable energy that FirstEnergy purchases for sale to customers.

Level of aggregation

Company-wide

Description of product/Group of products

Nuclear Energy

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

USEPA Avoided Emissions Calculator

% revenue from low carbon product(s) in the reporting year

Comment

Avoided emissions can be calculated based on the amount of nuclear energy produced by FirstEnergy.

Level of aggregation

Company-wide

Description of product/Group of products

Energy Efficiency

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

State regulatory programs

% revenue from low carbon product(s) in the reporting year

Comment

Avoided emissions can be calculated based on efficiency mandates in each state that FirstEnergy operates in.

C-EU4.6

(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your activities.

FirstEnergy's generating fleet utilizes very little natural gas, therefore methane emissions are not relevant to our organization's operations (less than 0.01% of total Scope 1 emissions).

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1, 2005

Base year end

December 31, 2005

Base year emissions (metric tons CO2e)

86,403,130

Comment

The 2005 base year emissions represent FirstEnergy's Scope 1 emissions.

Scope 2 (location-based)

Base year start
January 1, 2016

Base year end
December 31, 2016

Base year emissions (metric tons CO2e)
68,498.7

Comment
2016 Scope 2 emissions were calculated using kwh purchased for FirstEnergy's corporate locations. Regional specific emission factors were used based on the location of the buildings.

Scope 2 (market-based)

Base year start
January 1, 2016

Base year end
December 31, 2016

Base year emissions (metric tons CO2e)
60,282.3

Comment
2016 Scope 2 market based emissions were calculated using kwh purchased for FirstEnergy's corporate locations. The corporate facilities are within FirstEnergy's territory, therefore FirstEnergy specific CO2, CH4 and N2O rates were used.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Mandatory Greenhouse Gas Reporting Rule

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

32,874,709

Start date

January 1, 2018

End date

December 31, 2018

Comment

FirstEnergy's global Scope 1 emissions include FirstEnergy's stationary and fugitive Scope 1 emissions as reported to USEPA's GHG Mandatory Reporting rule

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

FirstEnergy has calculated both location and market based Scope 2 emissions.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

51,054

Scope 2, market-based (if applicable)

47,344

Start date

January 1, 2018

End date

December 31, 2018

Comment

FirstEnergy's Scope 2 location-based emissions include emissions associated with purchased power for FirstEnergy's corporate facilities. A regional eGRID factor was used based on the location of the facility.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Not evaluated

Explanation

FirstEnergy has not calculated Scope 3 emissions from purchased goods and services.

Capital goods

Evaluation status

Not evaluated

Explanation

FirstEnergy has not calculated Scope 3 emissions for capital goods.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

20,097,164

Emissions calculation methodology

Emissions were calculated using FirstEnergy's operating net purchases (net of sale-for-resale) as shown on FERC Form 401a and regional eGRID 2014 emission rates for CO2, CH4 and N2O. Purchases made from an FirstEnergy-owned generation source were not included, as those are included in FirstEnergy's Scope 1 emissions.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Upstream transportation and distribution

Evaluation status

Not evaluated

Explanation

FirstEnergy has not calculated Scope 3 emissions associated with upstream transportation and distribution.

Waste generated in operations

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

EPA's WARM model was used to calculate waste generated in operations.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

FirstEnergy calculated Scope 3 emissions associated with waste from mixed paper, mixed recyclable, and mixed MSW. These numbers were obtained from our waste management vendors. The total emissions calculated by EPA's WARM model was a negative number.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

10,506.4

Emissions calculation methodology

Travel agency numbers were used when supplied, otherwise EPA Climate Leaders emission factors were used.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

FirstEnergy's corporate travel agent provided GHG emissions data for FirstEnergy employee hotel stays, air flights, and rental cars. FirstEnergy internal records were used to include total number of miles expensed by FirstEnergy employees, and total miles flown on FirstEnergy's corporate jet. The bulk of the emissions were associated with total miles expensed by FirstEnergy employees.

Employee commuting

Evaluation status

Not evaluated

Explanation

FirstEnergy has not calculated Scope 3 emissions associated with employee commuting.

Upstream leased assets

Evaluation status

Not evaluated

Explanation

Scope 3 emissions from upstream leased assets have not been evaluated.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

Downstream transportation and distribution is capture in Scope 1 emissions.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Explanation

Downstream transportation and distribution is capture in Scope 1 emissions.

Use of sold products

Evaluation status

Not relevant, explanation provided

Explanation

Any GHG emissions associated with use of sold products are accounted for in Scope 1 emissions.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Explanation

The production and delivery of electricity does not result in any Scope 3 emissions associated with end of life treatment of sold products.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

FirstEnergy does not have any relevant Scope 3 emissions associated with downstream leased assets.

Franchises

Evaluation status

Not relevant, explanation provided

Explanation

FirstEnergy does not own any franchises.

Investments

Evaluation status

Not relevant, explanation provided

Explanation

Any relevant GHG emissions associated with FirstEnergy's investments would be captured in Scope 1 or Scope 2 emissions.

Other (upstream)

Evaluation status

Not relevant, explanation provided

Explanation

No other Scope 3 emissions are considered relevant for FirstEnergy.

Other (downstream)

Evaluation status

Not relevant, explanation provided

Explanation

No additional Scope 3 downstream GHG's are considered relevant for FirstEnergy.

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.003

Metric numerator (Gross global combined Scope 1 and 2 emissions)

32,922,053

Metric denominator

unit total revenue

Metric denominator: Unit total

11,261,000,000

Scope 2 figure used

Market-based

% change from previous year

3.8

Direction of change

Decreased

Reason for change

FirstEnergy's emissions continue to decrease through use of innovative technology and changes to fleet operations.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	32,579,190	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	367.6	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	589.5	IPCC Fifth Assessment Report (AR5 – 100 year)
SF6	120,586.6	IPCC Fifth Assessment Report (AR5 – 100 year)

C-EU7.1b

(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	5.29	120,586.6	FirstEnergy's calculated Scope 1 fugitive emissions include SF6 emissions as reported to the EPA's GHG MRR.
Combustion (Electric utilities)	32,579,190	367.6	120,531.9	32,579,557.6	The gross Scope 1 emissions associated with FirstEnergy's combustion includes CO2, CH4 and N2O.
Combustion (Gas utilities)	0	0	0	0	FirstEnergy does not have gas utilities.
Combustion (Other)	0	0	0	0	FirstEnergy does not have other combustion sources.

Emissions not elsewhere classified	0	0	0	0	No other Scope 1 emissions.

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America	32,874,709

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility
By activity

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
W.H. Sammis Plant	5,180,634.3	40.529477	-80.633962
Fort Martin Power Station	5,538,516.8	39.423859	-79.553991
Harrison Power Station	12,098,220.9	39.230213	-80.195185
Pleasants Power Station	6,659,463.9	39.230213	-81.172987
Mansfield	3,272,094.4	40.380371	-80.250071
Eastlake Plant	191.4	41.401351	-81.262941
Beaver Valley	551.8	40.62128	-80.42474
Davis Besse	2,604.2	41.60252	-83.09912
Perry	1,844.7	41.68682	-81.18402

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Stationary	32,754,122
Fugitive	120,586.6

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Comment
Electric utility generation activities	32,754,122	Scope 1 emissions associated with electric utility generation activities, as reported to USEPA's GHG Mandatory Reporting Rule.

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United States of America	51,054	47,344	97,045	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
FirstEnergy Corp	51,054	47,344

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	
Other emissions reduction activities	0	No change	0	
Divestment	0	No change	0	
Acquisitions	0	No change	0	
Mergers	0	No change	0	
Change in output	9,602,437	Decreased	22.6	FirstEnergy's generation output decreased from 2016-2018 .
Change in methodology	0	No change	0	
Change in boundary	0	No change	0	
Change in physical operating conditions	0	No change	0	
Unidentified	0	No change	0	
Other	0	No change	0	

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	203,526,551	203,526,551
Consumption of purchased or acquired electricity		0	0	0
Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		0	203,526,551	203,526,551

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application

Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Subbituminous Coal

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

102,097,668

MWh fuel consumed for self-generation of electricity

102,097,668

MWh fuel consumed for self-generation of heat

Comment

Fuels (excluding feedstocks)

Other, please specify

Nuclear

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

101,348,746

MWh fuel consumed for self-generation of electricity

101,348,746

MWh fuel consumed for self-generation of heat

Comment

Fuels (excluding feedstocks)

Fuel Oil Number 2

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

80,137

MWh fuel consumed for self-generation of electricity

80,137

MWh fuel consumed for self-generation of heat

Comment

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Fuel Oil Number 2

Emission factor

73.96

Unit

kg CO2 per million Btu

Emission factor source

EPA Table C-1 to Subpart C of 40 CFR Part 98

Comment

FirstEnergy uses the EPA standard for distillate fuel oil #2

Subbituminous Coal

Emission factor

9,328

Unit

kg CO2 per million Btu

Emission factor source

EPA Table C-1 to Subpart C of 40 CFR Part 98

Comment

FirstEnergy uses the EPA standard for bituminous coal.

Other

Emission factor

Unit

Emission factor source

Comment

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	72,422,411	5,606,984	0	0
Heat	0	0	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C-EU8.2e

(C-EU8.2e) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.

Coal – hard

Nameplate capacity (MW)

9,270

Gross electricity generation (GWh)

37,492.86

Net electricity generation (GWh)

34,240.82

Absolute scope 1 emissions (metric tons CO2e)

32,748,805

Scope 1 emissions intensity (metric tons CO2e per GWh)

873.47

Comment

Includes FirstEnergy's super-critical coal-fired units.

Lignite

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from lignite.

Oil

Nameplate capacity (MW)

179

Gross electricity generation (GWh)

45.4

Net electricity generation (GWh)

45.4

Absolute scope 1 emissions (metric tons CO2e)

317

Scope 1 emissions intensity (metric tons CO2e per GWh)

6.98

Comment

Gas

Nameplate capacity (MW)

545

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from gas.

Biomass

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from biomass.

Waste (non-biomass)

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from waste (nonbiomass)

Nuclear

Nameplate capacity (MW)

4,048

Gross electricity generation (GWh)

34,570.42

Net electricity generation (GWh)

32,944.22

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy has three nuclear generating plants.

Geothermal

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from geothermal.

Hydroelectric

Nameplate capacity (MW)

1,410

Gross electricity generation (GWh)

313.73

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Net generation for FirstEnergy's hydroelectric units was a negative number.

Wind

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from wind.

Solar

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not have any generation from solar.

Other renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not own any other renewable generating facilities.

Other non-renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

FirstEnergy does not own any other non-renewable electricity generating facilities.

Total

Nameplate capacity (MW)

15,332

Gross electricity generation (GWh)

72,422.41

Net electricity generation (GWh)

67,230.28

Absolute scope 1 emissions (metric tons CO2e)

32,749,122

Scope 1 emissions intensity (metric tons CO2e per GWh)

452.2

Comment

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

C-EU8.4

(C-EU8.4) Does your electric utility organization have a transmission and distribution business?

Yes

C-EU8.4a

(C-EU8.4a) Disclose the following information about your transmission and distribution business.

Country/Region

United States of America

Voltage level

Transmission (high voltage)

Annual load (GWh)

Scope 2 emissions (basis)

Scope 2 emissions (metric tons CO2e)

0

Annual energy losses (% of annual load)

Length of network (km)

28,731

Number of connections

Area covered (km2)

Comment

FirstEnergy's Scope 2 emissions are for power used in our facilities, and therefore is not applicable here. FirstEnergy's power purchased for sale to customers is accounted for in Scope 3 emissions

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Country/Region

United States of America

Voltage level

Distribution (low voltage)

Annual load (GWh)

161,379

Scope 2 emissions (basis)

Scope 2 emissions (metric tons CO2e)

0

Annual energy losses (% of annual load)

6.3

Length of network (km)

270,686

Number of connections

6,110,635

Area covered (km2)

171,404

Comment

FirstEnergy's Scope 2 emissions are for power used in our facilities, and therefore is not applicable here. FirstEnergy's power purchased for sale to customers is accounted for in Scope 3 emissions

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C-EU9.5a

(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
				FirstEnergy does not publically share this data

C-EU9.5b

(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Charging networks	FirstEnergy has included CAPEX in it's future years budgets for EV charging stations in our Potomac Edison operating company, located in Maryland. The estimated CAPEX spend for 2019 is included here.	900,000		

C-CO9.6/C-EU9.6/C-OG9.6

(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.

Investment start date

January 1, 2015

Investment end date

December 31, 2022

Investment area

Services

Technology area

Smart meters

Investment maturity

Large scale commercial deployment

Investment figure

397,000,000

Low-carbon investment percentage

0-20%

Please explain

FirstEnergy's Smart Meter program began in four of our operating companies (Met-Ed, Penelec, Pennsylvania Power Co, and West Penn Power Company) in 2015 and through 2018 has included more than $397,000,000 in investment. This Smart Meter program in those regions is planned to continue through 2022.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	No third-party verification or assurance
Scope 2 (location-based or market-based)	No third-party verification or assurance
Scope 3	No third-party verification or assurance

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Year on year change in emissions (Scope 1)	EPA Continuous Emissions Monitoring Systems (CEMs) Relative Accuracy Tests Audits (RATA) procedures certify monitors to ±10%.	FirstEnergy's Scope 1 emissions are considered high quality and verified

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, and we do not anticipate being regulated in the next three years

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations
Stakeholder expectations
Stress test investments

GHG Scope

Scope 1

Application

FirstEnergy's official 2018 reference forecast for power, capacity and natural gas is consistent with current policy and the 2018 EIA Annual Energy Outlook, and as such, does not include an implicit carbon price. However, we develop an alternative forecast scenario that assumes a potential carbon reduction policy with key assumptions consistent with the reductions mandated in the (now vacated) Clean Power Plan. Using information from Navigant Consulting and our internal planning tools, we estimated a CO2 emission "tax" which would be sufficient to reduce aggregate carbon emissions across PJM by forcing a redispatch of the generation fleet (with regard to the other assumptions in that scenario). That carbon price is presented below. We do not assume a specific variance in that price.

Actual price(s) used (Currency /metric ton)

0

Variance of price(s) used

Reference Case: zero - reflective of current applicable State and Federal regulations and policy trends.

Highest Carbon Price Case: prices reflect a limit consistent with the Clean Power Plan

	$/ton	$/metric ton
2019	$-	$-
2020	$-	$-
2021	$-	$-
2022	$-	$-
2023	$2.61	$ 2.88
2024	$4.78	$ 5.27
2025	$9.97	$10.98
2026	$14.21	$ 15.67
2027	$26.91	$ 29.66
2028	$31.86	$ 35.12
2029	$36.30	$ 40.01
2030	$38.36	$ 42.84
2031	$40.39	$ 44.52
2032	$41.97	$ 46.26
2033	$43.61	$ 48.07
2034	$45.29	$ 49.93
2035	$47.05	$ 51.86
2036	$48.86	$ 53.86
2037	$50.76	$ 55.96

Type of internal carbon price

Other, please specify

See application description.

Impact & implication

FirstEnergy is transitioning to a regulated company. We are investing in our infrastructure to enable emerging technologies and electrification. We are also making

the switch to a cleaner energy future by transitioning to renewable energy sources, deploying smart technologies and meeting our customers' energy needs in a more environmentally sustainable way. We're also taking aggressive steps to improve the environmental performance of our operations in the years ahead. We've established a goal to reduce CO2 emissions companywide by at least 90 percent below 2005 levels by 2045. This goal builds on the significant reduction in CO2 emissions we have already achieved since 2005 (62% to date). With the deactivation of several older coal-fired units and improvements in the efficiency of our remaining generating units, we're also creating a fleet that is increasingly cleaner, with significantly lower CO2 emissions. FirstEnergy is an industry leader in pursuing new technologies that show promise in achieving CO2 and other emissions reductions.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our customers

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number

100

% Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

FirstEnergy offers multiple programs to residential, commercial and industrial customers to help them better manage their energy use. These include major electricity end uses, such as HVAC equipment, lighting and building technologies, and commercial and industrial equipment, in addition to consumer behavioral programs.

Impact of engagement, including measures of success

In 2018, FirstEnergy's Energy Efficiency Department conducted monthly progress reviews and forecast our performance against state requirements. Programs offered by our utility companies have a solid track record for meeting or significantly exceeding each state's energy efficiency targets. In 2018, we produced energy efficiency savings of approximately 1.63 million megawatts across our service area.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers
Trade associations
Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Energy efficiency	Support with minor exceptions	FirstEnergy supported numerous bills where Energy and Efficiency was a component at both the state and federal level. FirstEnergy supports Energy Efficiency measures that are in the best interest of its customers.	FirstEnergy supports energy efficiency measures that are cost effective for its customers.
Clean energy generation	Support	FirstEnergy is a strong supporter of clean energy, including bills that support energy storage, nuclear, and renewables. In addition, FirstEnergy is a strong supporter of Research and Development technologies such as small modular reactors and energy storage.	FirstEnergy supports measures that invest in fuel diversity for all generation types. FirstEnergy has supported state clean energy legislation.
Adaptation or resilience	Support	FirstEnergy supported grid resiliency, critical infrastructure efforts, and fuel security provisions in legislative language.	FirstEnergy is committed to supporting the electric infrastructure, mitigate power outages, continued delivery of vital services and maintaining the flow of power to facilities critical to public health, safety, and welfare of our customers.

Climate finance	Support with minor exceptions	FirstEnergy supports appropriate financial support for zero-emission nuclear generation and grid resiliency adaptation.	FirstEnergy supports appropriate financial support for zero-emission nuclear generation and grid resiliency adaptation.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Edison Electric Institute (EEI)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

EEI member companies are committed to addressing the challenge of climate change and have undertaken a wide range of initiatives over the last 30 years to reduce, avoid or sequester GHG emissions. Policies to address climate change should seek to minimize impacts on consumers and avoid harm to U.S. industry and the economy.

How have you influenced, or are you attempting to influence their position?

FirstEnergy serves in a leadership role, participates in several committees including the ESG/Sustainability committee, and actively engages in EEI policy development and advocacy efforts.

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

FirstEnergy participates in the electric power research institute (EPRI) which conducts research on all aspects of electric power production and use, including fuels, generation and delivery, efficient management of energy use, environmental effects, and energy analysis.
FirstEnergy also participates in other initiatives with industry R&D consortiums and universities to address technology needs for its various business units in areas such as plant operaitons and maintenance, major component reliability, environmental controls, advance energy technoloiges, and transmission/distribution infrastructure to improve performance, and develop new technologies for advanced energy and grid applications.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

FirstEnergy has multiple policy-facing groups that work together to ensure that all direct and indirect activities that influence policy are consistent with our overall climate strategy. These groups work closely and coordinate with one another on all climate-related issues to ensure consistency in our corporate position.

The Policy and Support group handles internal coordination to ensure consistent positions throughout the company on both federal and state legislation and market policy issues. The Policy and Support group has a policy process that responds to policy proposals. The process begins with our internal Governmental Affairs Team identifying proposed legislation or other issues that needs an FirstEnergy position/response. Then the proposed legislation/issue is sent to Initial Review Team composed of internal subject matter experts to review and develop a position. Finally, the position is reviewed and approved by a cross functional Management Review Team.

FirstEnergy's Emerging Technologies Strategy team is responsible for developing the overall corporate strategy as it pertains to new, emerging technologies in the electric industry, such as energy storage, distributed energy resources and grid modernization. As part of that responsibility, the Emerging Technologies Strategy team is also responsible for monitoring and developing strategies as it pertains to policies at the state and federal level that drive the development of these technologies. The Emerging Technologies Strategy team is a key internal stakeholder that provides expertise and guidance on climate-related legislation at the federal and state levels as well .

FirstEnergy's Environment Department leads the Company's efforts and strategy as it pertains to all environmental regulations, guidelines, and initiatives at the local, state, and federal level; including climate-related issues dealing with regulation, policy, socio-economic impacts, and adaptation. The Environmental group is a key internal stakeholder that provides expertise and guidance on climate-related legislation at the federal and state levels as well.

FirstEnergy's Corporate Responsibility team is responsible for evaluating ways to create long-term stakeholder value through the implementation of a business strategy that focuses on positive impact to our stakeholders including leading efforts on our Environmental, Social, Governance strategy and our recently published Climate Report. The Corporate Responsibility group is a key internal stakeholder that provides expertise and guidance on climate related legislation at the federal and state levels as well.

C12.4

(C12.4) Have you published information about your organization’s response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

FirstEnergy 2018 Climate Report.pdf

Page/Section reference

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

FirstEnergy 2018 Annual Report.pdf

Page/Section reference

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

2019 Proxy Statement.PDF

Page/Section reference

Content elements

Governance
Strategy
Risks & opportunities

Comment

C14. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Senior Vice President and Chief Strategy Officer	Other C-Suite Officer

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to
I am submitting my response	Public	Investors

Please confirm below

I have read and accept the applicable Terms