Welcome to your CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

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

Public Service Enterprise Group (PSEG) is an energy company with a diversified business mix whose vision and formula for sustainability is to be a leading company of people providing safe, reliable, economic and greener energy. Our operations are located primarily in the Northeast and Mid-Atlantic United States. PSEG comprises of two principal direct operating subsidiaries: PSEG Power and Public Service Electric and Gas (PSE&G).

PSEG Power integrates the operations of its merchant nuclear and fossil generating assets with its wholesale power marketing businesses through competitive energy sales in well-developed energy markets and fuel supply functions. PSEG Power earns revenues from the generation and marketing of power and natural gas to hedge business risks and optimize the value of its portfolio of power plants, other contractual arrangements, and oil and gas storage facilities. This is achieved primarily by selling power and transacting in natural gas and other energy-related products on the spot market or using short- or long-term contracts for physical and financial products. Power also has a portfolio of solar generation facilities and earns revenues under long-term sales contracts for power and environmental products. Power's major power-producing subsidiaries include PSEG Fossil, which owns and operates fossil-fuel electric generation facilities, and PSEG Nuclear, which owns and operates nuclear power plants.

PSE&G is a franchised public utility in New Jersey and earns revenues from regulated rate tariffs, under which it provides electric transmission and electric and gas distribution to residential, commercial and industrial customers in its New Jersey service territory. PSE&G offers appliance services and repairs to customers throughout its service territory and has implemented regulated energy efficiency programs and invested in electric vehicle infrastructure, solar generation and battery storage within New Jersey.

PSEG's other direct, wholly owned subsidiaries are: PSEG Energy Holdings (Energy Holdings), which earns revenues primarily from its portfolio of lease investments; PSEG Long Island (PSEG LI), which operates the Long Island Power Authority's (LIPA) transmission and distribution system under a contractual agreement; and PSEG Services Corp. (Services), which provides PSEG and its operating subsidiaries with certain management, administrative and general services at cost.

Forward Looking Statement: Certain of the matters discussed in this document about our and our subsidiaries' future performance, including, without limitation, future revenues, earnings, strategies, prospects, consequences and all other statements that are not purely historical

constitute “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward- looking statements are subject to risks and uncertainties, which could cause actual results to differ materially from those anticipated. Such statements are based on management’s beliefs as well as assumptions made by and information currently available to management. When used herein, the words “anticipate,” “intend,” “estimate,” “believe,” “expect,” “plan,” “should,” “hypothetical,” “potential,” “forecast,” “project,” variations of such words and similar expressions are intended to identify forward-looking statements. Factors that may cause actual results to differ are often presented with the forward-looking statements themselves. Other factors that could cause actual results to differ materially from those contemplated in any forward- looking statements made by us herein are discussed in filings we make with the United States Securities and Exchange Commission (SEC), including our 2018 Annual Report on Form 10-K and subsequent reports on Form 10-Q and Form 8-K. These factors include, but are not limited to:

- fluctuations in wholesale power and natural gas markets, including the potential impacts on the economic viability of our generation units;
- our ability to obtain adequate fuel supply;
- any inability to manage our energy obligations with available supply;
- PSE&G’s proposed investment programs may not be fully approved by regulators and its capital investment may be lower than planned;
- increases in competition in wholesale energy and capacity markets;
- changes in technology related to energy generation, distribution and consumption and customer usage patterns;
- economic downturns;
- third-party credit risk relating to our sale of generation output and purchase of fuel;
- adverse performance of our decommissioning and defined benefit plan trust fund investments and changes in funding requirements;
- changes in state and federal legislation and regulations, and PSE&G’s ability to recover costs and earn returns on authorized investments;
- the impact of any future rate proceedings;
- risks associated with our ownership and operation of nuclear facilities, including regulatory risks, such as compliance with the Atomic Energy Act and trade control, environmental and other regulations, as well as financial, environmental and health and safety risks;
- the impact on our New Jersey nuclear plants if such plants are not selected to participate in future Zero Emission Certificate (ZEC) programs or if adverse changes are made to the capacity market construct;
- adverse changes in energy industry laws, policies and regulations, including market structures and transmission planning;
- changes in federal and state environmental regulations and enforcement;
- delays in receipt of, or an inability to receive, necessary licenses and permits;
- adverse outcomes of any legal, regulatory or other proceeding, settlement, investigation or claim applicable to us and/or the energy industry;
- changes in tax laws and regulations;
- the impact of our holding company structure on our ability to meet our corporate funding needs, service debt and pay dividends;
- lack of growth or slower growth in the number of customers or changes in customer demand;
- any inability of PSEG Power to meet its commitments under forward sale obligations;
- reliance on transmission facilities that we do not own or control and the impact on our ability to maintain adequate transmission capacity;
- any inability to successfully develop, obtain regulatory approval for, or construct generation, transmission and distribution projects;
- any equipment failures, accidents, severe weather events or other incidents that impact our ability to provide safe and reliable service to our customers;
- our inability to exercise control over the operations of generation facilities in which we do not maintain a controlling interest;

- any inability to recover the carrying amount of our long-lived assets and leveraged leases;
- any inability to maintain sufficient liquidity;
- any inability to realize anticipated tax benefits or retain tax credits;
- challenges associated with recruitment and/or retention of key executives and a qualified workforce;
- the impact of our covenants in our debt instruments on our operations; and
- the impact of acts of terrorism, cybersecurity attacks or intrusions.

All of the forward-looking statements made in this document are qualified by these cautionary statements and we cannot assure you that the results or developments anticipated by management will be realized or even if realized, will have the expected consequences to, or effects on, us or our business, prospects, financial condition, results of operations or cash flows. Readers are cautioned not to place undue reliance on these forward-looking statements in making any investment decision. Forward-looking statements made in this document apply only as of the date of this document. While we may elect to update forward-looking statements from time to time, we specifically disclaim any obligation to do so, even in light of new information or future events, unless otherwise required by applicable securities laws.

The forward-looking statements contained in this document are intended to qualify for the safe harbor provisions of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended

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.

Equity share

C-EU0.7

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

Row 1

Electric utilities value chain

Electricity generation
Transmission
Distribution

Other divisions

Gas storage, transmission and distribution
Smart grids / demand response
Battery storage

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
Board Chair	Our Board of Directors takes an active role in overseeing sustainability, Environmental Social and Governance (ESG) and corporate citizenship issues including climate strategy, and the associated political, lobbying and trade association spend. The Corporate Governance Committee holds the primary responsibility, as enumerated in its charter, of overseeing sustainability matters for our enterprise and will be responsible for overseeing our transition to a net-zero future. PSEG is a provider of low carbon solutions for our customers and a large producer of zero carbon electricity, therefore our business strategy includes elements related to climate change, including preserving nuclear, as well as adapting and modernizing our distribution utility systems in response to the extreme weather effects of climate change. In that sense, The Board understands that its continued oversight of our Company's commitment to principles of sustainability is of increasing importance to stockholders, and other constituencies.

Chief Executive Officer (CEO)	Due to the carbon intensive nature of our industry, PSEG's Chairman, President and CEO, Ralph Izzo, is directly responsible for managing PSEG's response to climate change risk. As Chairman of the Board of Directors, he has direct oversight over corporate strategy, structure and management. Starting in 2019, PSEG belongs to the CEO Climate Dialogue, a cross-sectoral organization that seeks to leverage CEO voices to build support for a national price on carbon and whose guiding principles for federal action include economy-wide GHG emission reductions of 80% or more by 2050.

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 – some meetings	• Setting performance objectives • Overseeing major capital expenditures, acquisitions and divestitures • Monitoring and overseeing progress against goals and targets for addressing climate-related issues	As a part of the Enterprise Risk Management (ERM) process, top risks and emerging risks, including climate-related risks, are reported on at least annually to the Board, Audit and Corporate Governance Committees. A detailed specific risk review of each of these top risks is scheduled with the Board or with a Committee of the Board on a schedule driven by the criticality and speed of evolution of the risk. In addition, the Board and the Committees of the Board receive at each of their meetings (up to 7 per year) a brief risk update on significant risk developments since the previous report, including on ESG concerns. ESG concerns are covered annually and the Corporate Governance Committee is informed on climate-related issues on a continuous basis as issues emerge. Specific examples include: - The Corporate Governance Committee of the Board being involved in the setting of emission reduction targets - The Corporate Governance Committee of the Board being informed at least annually about the development of ESG concerns in the industry

		- The Board being involved in decisions to build renewable power generation, close or divest fossil-fueled power generation, or invest in programs such as energy efficiency, energy storage, electric vehicles, and resiliency to unusual weather events for gas and electric distribution and transmission

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
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Chief Financial Officer (CFO)	Managing climate-related risks and opportunities	More frequently than quarterly
Chief Risk Officer (CRO)	Assessing climate-related risks and opportunities	More frequently than quarterly
Other C-Suite Officer, please specify General Counsel	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Sustainability committee	Managing climate-related risks and opportunities	Quarterly
Environmental, Health, and Safety manager 1	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Chief Operating Officers	Officers reporting to the COO of PSE&G and PSEG Power have responsibility for preserving zero emissions generation and renewable energy procurement. They are also responsible for compliance with state and environmental and clean energy laws, energy efficiency and maintenance	More frequently than quarterly

	of a reliable and resilient grid to support the expanded use of renewables	
Environment/ Sustainability manager 💬2	Assessing climate-related risks and opportunities	More frequently than quarterly
Other C-Suite Officer, please specify Sr VP Corporate Citizenship	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

💬1Environmental Counsel reporting to General Counsel.

💬2ESG & Sustainability Manager

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).

(1) The Executive Officers Group (EOG), comprised of our most senior executives, has direct responsibility for governance and oversight of PSEG's climate change strategy and associated Green House Gas (GHG) and climate change programs. These programs focus on GHG mitigation within our own operations, contributing to reducing overall emissions from the energy sector, and driving climate change adaptation and resiliency efforts. Responsibility for sustainability sits within the newly created Corporate Citizenship organization to ensure that sustainability is considered in the decision-making at the highest levels within the organization. This group presents sustainability strategy materials at least annually to the Board of Directors. These materials include performance on goals and Key Performance Indicators, including climate change related metrics and emission reduction targets.

(2) The PSEG Sustainability Council assists PSEG in the formulation, prioritization and implementation of strategies and initiatives to achieve corporate sustainability and improve ESG and Sustainability performance. It also serves as a vehicle to consider sustainability as an organizing principle across all operations in order to realize opportunities and manage risks deriving from environmental and social developments. This council is chaired by PSEG's Senior Vice President Corporate Citizenship who has responsibility for governance and oversight of PSEG's climate change strategy and ESG issues in general. A diverse range of internal stakeholders representing the different business functions and lines of business are members of this council, provide information, review communications and support the data management process.

(3) The environmental policy group, which reports to the General Counsel, is responsible for data collection, for monitoring climate issues from an internal and external perspective, and for the coordination of engagement with stakeholders.

(4) Additionally we have formed a Climate Engagement Council chaired by the VP Federal & State Governmental Affairs, in order to ensure all of the corporate objectives and strategies are aligned with our climate priorities as well as with NJ's Clean Energy and Climate goals.

(5) The CFO, General Counsel, Chief Operating Officers, and Sr VP Corporate Citizenship all report to the CEO. The CRO reports to the CFO. The Environmental, Health, and Safety manager (Environmental Counsel reports to the General Counsel, The Environment/ Sustainability manager reports to the VP of Federal and State Governmental Affairs.

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?

Corporate executive team

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction projects

Comment

Executives in PSE&G, PSEG Power, the Law department, Corporate Finance, Corporate Citizenship and Procurement have specific performance goals related to climate change management and disclosure factored into their annual scorecard goals and/or performance plans. Attainment of these goals impacts annual compensation. As part of PSEG's performance-based compensation structure, employees whose positions are related to preserving nuclear, managing environmental and climate change impacts such as developing low-carbon infrastructure, managing energy efficiency programs, and implementing and developing programs such as electric vehicles, among others, are incentivized to achieve annual goals and targets related to these areas. We are currently working on a full integration of our climate strategy into the executive compensation program, linking this directly to performance and disclosure. PSEG intends to expand implementation of these incentives in 2020.

Who is entitled to benefit from these incentives?

Management group

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction project

Comment

PSEG's compensation program is based on the fundamental premise of pay for performance. This compensation can come in several forms including, base pay and incentive pay. PSEG's business goals include achieving financial, strategic and operating goals. Achieving our financial goals is predicated upon successful execution of our business strategy, which includes deployment of emission abatement measures such as energy efficiency, new generation and renewable energy. Additionally, PSEG's vision includes commitments to culture and business transformation as well as its voluntary emission reduction commitments.

Who is entitled to benefit from these incentives?

Other C-Suite Officer

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction projects

Comment

Executives in PSE&G, PSEG Power, the Law department, Corporate Finance, Corporate Citizenship and Procurement, have specific performance goals related to climate change management and disclosure factored into their annual scorecard goals and/or performance plans. Attainment of these goals impacts annual compensation. As part of PSEG's performance-based compensation structure, employees whose positions are related to managing environmental and climate change impacts such as developing low-carbon infrastructure, managing energy efficiency programs, and implementing and developing programs such as electric vehicles, among others, are incentivized to achieve annual goals and targets related to these areas.

Who is entitled to benefit from these incentives?

Chief Executive Officer (CEO)

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction projects

Comment

PSEG's compensation program is based on the fundamental premise of pay for performance. This compensation can come in several forms including, base pay and incentive pay. PSEG's business goals include achieving financial, strategic and operating goals. Achieving our financial goals is predicated upon successful execution of our business strategy, which includes deployment of emission abatement measures such as energy efficiency, new generation and renewable energy. Additionally, PSEG's vision includes commitments to culture and business transformation as well as its voluntary emission reduction commitments.

We are currently working on a full integration of our climate strategy into the executive compensation program, linking this directly to performance and disclosure. PSEG intends to expand implementation of these incentives in 2020.

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	Short term is within one year of assessment
Medium-term	1	5	This is the time period of the business plan
Long-term	5	40	This is beyond the business planning horizon

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	Annually	>6 years	We have two assessments as part of the Enterprise Risk Management life cycle, we look at events that

			may impact the company from 1-5 years and we also look at emerging risks 5+ years.

C2.2b

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

There are several streams of work the Company conducts for identifying and assessing climate-related risks:

1) The Enterprise Risk Management (ERM) program coordinates an annual identification and assessment of enterprise-level top risks and emerging risks. This process involves meeting with a wide-range of internal subject matter experts to identify new risks that might have appeared in the functional area or line of business and to re-assess previously-identified risks. This identification effort is also informed by a review of externally-published lists of top risks for our industry and a review of external events. Additionally, the annual identification process is also informed by the risk updates that are compiled and communicated to the Board and Committees of the Board seven times a year. The assessment of each top risk is made using an enterprise-wide set of probability and impact scales. The impact scales have a number of dimensions, including Financial, Reputation, Legal & Compliance, Customer Bill Impacts, Delivery Service Reliability, Environmental, and Health & Safety. Climate-related risks appear as both a separate emerging risk and as a component of other risks, such as the impact of climate-related concerns on the amount of renewable power generation, on the price of greenhouse gas emission allowances, on customer consumption levels and preferences, and on governmental support for nuclear generation, energy efficiency, renewable generation, and electric vehicles, as well as the impact of climate change on the weather event risks.

2) Industry Outlook – Each year PSEG produces an internal long-term industry outlook for executive management and the PSEG Board of Directors, which addresses each of the main industry drivers (e.g. electricity supply/demand and price trends, natural gas supply/demand and price trends, climate change and environmental policies, power market design, regulatory trends, and technology trends). The industry outlook also covers emerging industry drivers (e.g. potential for electric vehicles and energy storage). The industry outlook has a long-term time horizon (i.e. up to 25 years), and is intended to provide a longer-term view of relevant industry information. PSEG utilizes paid research from highly reputable industry consultants (e.g. IHS Markit, PIRA, Wood Mackenzie, Bloomberg New Energy Finance, and DNV GL) as support for its industry outlook. A number of these consultants provide scenarios of alternative industry outcomes – which PSEG uses to further inform its strategic direction, and to identify any potential strategic blind spots.

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	PSEG's business is highly regulated by both state and federal agencies. "In June 2019, the EPA released the final Affordable Clean Energy (ACE) rule as a replacement for the repealed Clean Power Plan. The ACE rule gives states great flexibility to evaluate specific heat rate improvement technologies and practices to be applied at coal-fired electric generating units. States have three years from the date of finalization to submit a plan that establishes a standard of performance that reflects the degree of emission limitation through the application of heat rate improvement technologies and practices. We cannot estimate the impact of this action on our business or results of operations". (PSEG 2019 second quarter 10Q p 94.)
Emerging regulation	Relevant, always included	PSEG's business is highly regulated by both state and federal agencies. In its 2018 Form 10K there is mention of uncertainty around potential emerging regulation (state and federal) as a result of climate risk. "In June 2018, the NJ Department of Environmental Protection finalized two rules that begin New Jersey's re-entry into the Regional Greenhouse Gas Initiative (RGGI). The first rule is the mechanism that establishes New Jersey's initial cap on GHG emissions of 18 million tons in 2020. The final rule follows the RGGI model rule with a cap that will decline three percent annually through 2030 to a final cap of 11.5 million tons. New Jersey is committed to a start date of January 1, 2020. The second rule establishes the framework for how New Jersey will spend the RGGI auction proceeds". (PSEG 2018 10K p.21)
Technology	Relevant, always included	PSEG is reliant on various technologies at both Power and PSE&G to conduct business. Technologies related to climate change are viewed as both a risk and opportunity. A specific example pertains to federal and state incentives and how technologies are advancing and is reported in our 10K: "Federal and state incentives for the development and production of renewable sources of power have allowed for the penetration of competing technologies, such as wind, solar, and commercial-sized power storage. Additionally, the development of Demand Side Management (DSM) tools and practices can impact peak demand requirements for some of our markets at certain times during the year. The continued development of subsidized, competing power generation technologies and significant development of DSM tools and practices could alter the market and price structure for power generation, and could result in a reduction in load requirements, negatively impacting our financial condition, results of operations and cash flows. Technological advances driven by federal laws mandating new levels of energy efficiency in end-use electric devices or other improvements in, or applications of, technology could also lead to declines in per capita energy consumption". (PSEG 2018 10K p. 27)

Legal	Relevant, always included	Legal implications of climate change are relevant and include the effects of climate regulation. A specific example included in the PSEG 2018 10K: "We are subject to extensive federal, state and local environmental laws and regulations regarding air quality, water quality, site remediation, land use, waste disposal, the impact on global climate, natural resources damages and other matters. These laws and regulations affect how we conduct our operations and make capital expenditures. There have been a number of recent changes to existing environmental laws and regulations and this trend may continue. Changes in these laws, or violations of laws, could result in significant increases in our compliance costs, capital expenditures to bring our facilities into compliance, operating costs for remediation and clean-up actions, civil penalties or damages from actions brought by third parties for alleged health or property damages." (PSEG 2018 10K p.31)
Market	Relevant, always included	A transition to a resilient low-carbon economy has significant market risk implications at both the federal and state level for PSEG. We will continue to seek to influence public policy in an effort to mitigate flaws in the design of wholesale power markets that do not recognize the environmental and fuel diversity benefits of our Salem, Peach Bottom, and Hope Creek nuclear facilities. Our goal is to preserve nuclear energy as a critically important resource, benefiting the state's environment, economy and energy reliability.
Reputation	Relevant, always included	Stakeholder perception and engagement is at the forefront of PSEG's environmental stewardship as part of its sustainability efforts. A specific example of this is stated in the 2018 Proxy Statement: "Environmental stewardship and sustainability require strong commitments and excellent management. Our Environmental Health and Safety Policy establishes our commitment to conduct our business in a safe and responsible manner. Our strong relationships with the public sector, renewable energy developers and policymakers help us identify and implement innovative environmental solutions". (PSEG 2019 Proxy Statement page 7) PSEG just unveiled significant extension of the "Powering Progress" vision: announcing that PSEG is on track to cut its Power fleet carbon emissions by 80 percent from 2005 levels by 2046. This goal supports PSEG's position among the energy sector's most progressive power providers. For additional detail see: https://www.psegpoweringprogress.com/
Acute physical	Relevant, always included	Acute physical risks are inherent in the power and utilities business. We consider catastrophic weather events in our business continuity plans and have storm plans for events that may occur within our service territory. Specific examples of this in the 2018 10K and 2018 Annual

		Report include: “In addition, the physical risks of severe weather events, such as experienced from Hurricane Irene and Superstorm Sandy, and of climate change, changes in sea level, temperature and precipitation patterns and other related phenomena have further exacerbated these risks. Such issues experienced at our facilities, or by others in our industry, could adversely impact our revenues; increase costs to repair and maintain our systems; subject us to potential litigation and/or damage claims, fines/penalties; and increase the level of oversight of our utility and generation operations and infrastructure through investigations or through the imposition of additional regulatory or legislative requirements. Such actions could adversely affect our costs, competitiveness and future investments, which could be material to our financial position, results of operations and cash flow. For our Transmission and Distribution (T&D) business, the cost of storm restoration efforts may not be fully recoverable through the regulatory process.” “At PSE&G, our focus is on enhancing system reliability and resiliency, meeting customer expectations and supporting public policy objectives by investing capital in T&D infrastructure and clean energy projects.” (PSEG 2018 10K p.43)
Chronic physical	Relevant, always included	Chronic physical risks are present in the Power and PSE&G businesses. “We may have to reconfigure plants, which may lead to asset impairment (premature impairment or devaluation) and may have to harden the system and facilities to adapt to changing conditions such as precipitation patterns and rising sea levels. Specific examples of this appear in the 10K and Annual Report: “In addition, the physical risks of severe weather events, such as experienced from Hurricane Irene and Superstorm Sandy, and of climate change, changes in sea level, temperature and precipitation patterns and other related phenomena have further exacerbated these risks. Such issues experienced at our facilities, or by others in our industry, could adversely impact our revenues; increase costs to repair and maintain our systems” (PSEG 2018 10K p.35) “In May 2018, we received approval for our Gas System Modernization Program II (GSMP II), an expanded, five-year program to invest $1.9 billion beginning in 2019 to replace approximately 875 miles of cast iron and unprotected steel mains in addition to other improvements to the gas system. Approximately $1.6 billion will be recovered through periodic rate roll-ins, with the remaining $300 million to be recovered through a future base rate proceeding.” (PSEG 2018 10k p 43).
Upstream	Relevant, always included	Power generation has been adapting to climate change regulation on an ongoing basis for several years and continues to implement measures as new plants are built. Specific examples of upstream impacts due to climate change include the EPA’s New Source Performance Standards (NSPS). A specific example of this is reported in the PSEG 2018 10K: “CO2 Regulation under the CAA—In October 2015, the EPA published

		the New Source Performance Standards (NSPS) for new power plants. The NSPS establishes two emission standards for CO2 for the following categories: (i) fossil fuel-fired utility boilers and integrated gasification combined cycle units, and (ii) natural gas combustion turbines. Simple cycle combustion turbines are exempt from the rule". (PSEG 2018 10K p. 21).
Downstream	Relevant, always included	Climate-related impacts to our customers are a high priority as they have been subjected to severe weather events increasing in size and frequency. A specific example of this is stated in the PSEG 2018 10K: "The success of our businesses is dependent on our ability to continue providing safe and reliable service to our customers while minimizing service disruptions. We are exposed to the risk of equipment failures, accidents, severe weather events, or other incidents, which could result in damage to, or destruction of our facilities or damage to persons or property. For instance, equipment failures in our natural gas distribution could give rise to a variety of hazards and operating risks, such as leaks, accidental explosions and mechanical problems, which could cause substantial financial losses and harm our reputation. In addition, the physical risks of severe weather events, such as experienced from Hurricane Irene and Superstorm Sandy, and of climate change, changes in sea level, temperature and precipitation patterns and other related phenomena have further exacerbated these risks". (PSEG 2018 10K p. 35)

C2.2d

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

The Enterprise Risk Management (ERM) program highlights key mitigation actions for the top enterprise risks. This is done in the annual ERM report on top enterprise risks. In addition, each risk review of specific risks contains more detailed mitigation and response actions associated with specific causes and consequences of the risk under review, and the ERM program includes periodic reviews of the mitigation and response actions that are being taken in response to top enterprise risks, and a discussion of whether additional mitigations are warranted. These committed or proposed mitigation actions for top enterprise risks are reviewed at the Enterprise Risk Management Committee, a management committee comprised of all the CEO direct reports and additional officers.

The responsibility for managing a specific risk lies with the person in the organization who is best positioned to own the risk. The level of the risk owner in the organization depends on the magnitude and scope of the risk. The organization in which the risk owner is selected will be either a specific line of business or, if the risk affects several units, a corporate functional risk owner.

An example of climate-related acute physical risk mitigation is the Energy Strong infrastructure investment implemented by our utility subsidiary PSE&G. The need for this program crystalized after the 2012 Superstorm Sandy created flooding of electrical substations that caused large-scale power outages. In response, PSE&G developed a capital investment program designed to elevate substations and undertake other storm hardening measures. This program design and implementation was the responsibility of the SVP of Delivery Projects & Construction and the CEO of PSE&G. The program was approved by the PSE&G Board of Directors and the NJ Board of Public Utilities and the identified projects were undertaken. This provided risk mitigation for our customers and an opportunity for growth for our business. During Subtropical Storm Alberto in May 2018, our investments proved their value when floodwaters covered the site of our Ewing Township substation, but did not reach new, raised equipment, and no customer served by this substation lost power due to flooded equipment.

An example of climate-related transition risk mitigation in the market area is the growing interest from our utility customers in energy efficiency services and electric vehicle charging infrastructure, an interest that is supported and shared by the State of New Jersey. This trend was identified as part of the annual enterprise-wide risk assessment conducted at the end of 2017. A Customer Trends Risk was placed on the enterprise heat map at that time, along with a commitment to an in-depth review of this risk during 2018. The ERM department and the risk owner analyzed the risk, and presented the risk review to the Enterprise Risk Management Committee and ultimately to the Corporate Governance Committee of the Board of Directors. This risk review identified the risk to the business of not being responsive to customers' new expectations and the opportunity to provide additional offerings. In parallel, the risk owner within the utility line of business developed a proposed program including energy efficiency measures and electric vehicle charging stations. PSEG's CEO continued to lead the broader development and promotion of a clean energy transformation strategy for the enterprise aligned with customers' interests. The program proposal was subsequently presented to the New Jersey Board of Public Utilities where it is under consideration.

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

Physical risk

Primary climate-related risk driver

Chronic: Rising sea levels

Type of financial impact

Increased capital costs (e.g., damage to facilities)

Company- specific description

We are exposed to the risk of equipment failures, accidents, severe weather events, or other incidents which could result in damage to, or destruction of our facilities or damage to persons or property. For instance, equipment failures in our natural gas distribution infrastructure could give rise to a variety of hazards and operating risks, such as leaks, accidental explosions and mechanical problems, which could cause substantial financial losses and harm our reputation. In addition, the physical risks of severe weather events, such as experienced from Hurricane Irene and Superstorm Sandy, and of climate change, changes in sea level, temperature and precipitation patterns and other related phenomena have further exacerbated these risks. Such issues experienced at our facilities, or by others in our industry, could adversely impact our revenues; increase costs to repair and maintain our systems; subject us to potential litigation and/or damage claims, fines/ penalties; and increase the level of oversight of our utility and generation operations and infrastructure through investigations or through the imposition of additional regulatory or legislative requirements. Such actions could adversely affect our costs, competitiveness and future investments, which could be material to our financial position, results of operations and cash flow. For our T&D business, the cost of storm restoration efforts may not be recoverable through the regulatory process. In addition, the inability to restore power to our customers on a timely basis could also materially damage our reputation. Higher sea levels will increase the baseline for flooding from coastal storms and therefore the impacts of coastal storms. In addition, climate change may change the characteristics and severity of storm systems.

Time horizon

Long-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)

N/A

Potential financial impact figure – minimum (currency)

N/A

Potential financial impact figure – maximum (currency)

N/A

Explanation of financial impact figure

The impact has not been quantified financially

Management method

Since 2010, PSE&G has experienced the four most disruptive storms in its operating history. In addition, because the 2016 and 2017 hurricane seasons were among the most active on record, investing in infrastructure is more critical than ever. Over the past few years, our investments have altered our business mix to reflect a higher percentage of earnings contribution by PSE&G. Over the next five years, we expect to invest between $12 billion and $14.5 billion in our regulated utility business.

PSE&G's Energy Strong Program (ES I), Program is designed to "harden" and improve the resiliency of PSE&G's electric and gas distribution systems. Hardening improves the durability and stability of energy infrastructure, making it better able to withstand the impacts of hurricanes and weather events without sustaining major damage. Resiliency measures do not prevent damage; but rather they enable energy systems to continue operating despite damage and/or promote a rapid return to normal operations when damages/outages do occur.

In May 2014, PSE&G received approval of a $1.22 billion Energy Strong Program (ES I), PSE&G's first phase of programs to protect and strengthen the utility's electric and gas systems against recent severe weather events. We completed our Energy Strong Program I (ES I) with a total spend of $1 Billion.

In June 2018, PSE&G filed for its Energy Strong Program II (ES II), a proposed five-year program as an extension and expansion of its ES Program. In August 2019, PSE&G reached principle settlement with key parties, including the New Jersey Board of Public Utilities, on its Energy Strong II filing that provides for $842 million of investment ($741 million electric and $101 million gas) for projects beginning in the fourth quarter 2019 with completion by December 2023. This will allow for the continuation of the utility's work under the first phase of Energy Strong to harden gas and electric infrastructure and improve reliability.

Cost of management

1,842,000,000

Comment

Cost above: $1 billion from ES I plus the recent ES II settlement in which we expect to invest $842 million over the next few years.

During Subtropical Storm Alberto in May 2018, our Energy Strong investments proved their value when floodwaters covered the site of our Ewing Township substation, but did not reach new, raised equipment. Thanks to this Energy Strong work, no customer served by this substation lost power due to flooded equipment.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact

Increased capital costs (e.g., damage to facilities)

Company- specific description

We are exposed to the risk of equipment failures, accidents, severe weather events, or other incidents, which could result in damage to, or destruction of our facilities or damage to persons or property. For instance, equipment failures in our natural gas distribution could give rise to a variety of hazards and operating risks, such as leaks, accidental explosions and mechanical problems, which could cause substantial financial losses and harm our reputation. In addition, the physical risks of severe weather events, such as experienced from Hurricane Irene and Superstorm Sandy, and of climate change, changes in sea level, temperature and precipitation patterns and other related phenomena have further exacerbated these risks. Such issues experienced at our facilities, or by others in our industry, could adversely impact our revenues; increase costs to repair and maintain our systems; subject us to potential litigation and/or damage claims, fines/ penalties; and increase the level of oversight of our utility and generation operations and infrastructure through investigations or through the imposition of additional regulatory or legislative requirements. Such actions could adversely affect our costs, competitiveness and future investments, which could be material to our financial position, results of operations and cash flow. For our T&D business, the cost of storm restoration efforts may not be recoverable through the regulatory process. In addition, the inability to restore power to our customers on a timely basis could also materially damage our reputation. Higher sea levels will increase the baseline for flooding from coastal storms and therefore the impacts of coastal storms. In addition, climate change may change the characteristics and severity of storm systems.

Time horizon

Current

Likelihood

Virtually certain

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

The impact has not been quantified financially

Management method

Since 2010, PSE&G has experienced the four most disruptive storms in its operating history. In addition, because the 2016 and 2017 hurricane seasons were among the most active on record, investing in infrastructure is more critical than ever. Over the past few years, our investments have altered our business mix to reflect a higher percentage of earnings contribution by PSE&G. Over the next five years, we expect to invest between $12 billion and $14.5 billion in our regulated utility business.

PSE&G's Energy Strong Program (ES I), Program is designed to "harden" and improve the resiliency of PSE&G's electric and gas distribution systems. Hardening improves the durability and stability of energy infrastructure, making it better able to withstand the impacts of hurricanes and weather events without sustaining major damage. Resiliency measures do not prevent damage; but rather they enable energy systems to continue operating despite damage and/or promote a rapid return to normal operations when damages/outages do occur.

In May 2014, PSE&G received approval of a $1.22 billion Energy Strong Program (ES I), PSE&G's first phase of programs to protect and strengthen the utility's electric and gas

systems against recent severe weather events. We completed our Energy Strong Program I (ES I) with a total spend of $1 Billion dollars.

In June 2018, PSE&G filed for its Energy Strong Program II (ES II), a proposed five-year program as an extension and expansion of its ES Program. In August 2019, PSE&G reached principle settlement with key parties, including the New Jersey Board of Public Utilities, on its Energy Strong II filing that provides for $842 million of investment ($741 million electric and $101 million gas) for projects beginning in the fourth quarter 2019 with completion by December 2023. This will allow for the continuation of the utility's work under the first phase of Energy Strong to harden gas and electric infrastructure and improve reliability.

Cost of management

$1,842,000,000

Comment

This amount reflects $1 billion from ES I and $842 million from ES II.

During Subtropical Storm Alberto in May 2018, our Energy Strong investments proved their value when floodwaters covered the site of our Ewing Township substation, but did not reach new, raised equipment. Thanks to this Energy Strong work, no customer served by this substation lost power due to flooded equipment

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Identifier

Risk 3

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

Other, please specify

Acquisition of allowances/payment of taxes based on emissions from our fossil fuel-fired electric generating units

Company- specific description

PSEG believes that climate change is the preeminent challenge of our time and with it comes significant business opportunities and responsibilities. As a leader in low-carbon energy, PSEG Power is recognized for having the third lowest carbon emission rates among the nation's largest power producers in the United States. PSEG has long advocated for federal legislation to limit and reduce GHG emissions. Absent a comprehensive legislative solution, we have supported the steps taken by states to reduce GHGs. PSEG has been factoring climate change into its business decisions and investments since the early 1990s.

In 2018, PSEG introduced its "Powering Progress" vision for the future of our company – a future in which we help our customers use less energy, ensure that the energy they use is cleaner and greener, and deliver that energy more reliably than ever before. In 2019, PSEG introduced a significant extension of the "Powering Progress" vision: announcing that PSEG is on track to cut its power fleet carbon emissions by 80 percent, from 2005 levels, by 2046. This goal continues PSEG's position among the energy sector's most progressive power providers. Further, PSEG believes that with necessary advances in such critical areas as public energy policy, carbon-capture technology and customer behavior that our generation fleet can achieve net-zero carbon emissions by 2050. Starting in 2020 all of our wholly owned fossil fuel-fired electric generating units will be subject to a price on carbon (RGGI).

Time horizon

Short-term

Likelihood

Very likely

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

The impact has not been quantified financially

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Management method

As a leader in low-carbon energy, PSEG has long advocated for federal legislation to limit and reduce GHG emissions. Absent a comprehensive legislative solution, we have supported the steps taken by states to reduce GHGs. PSEG has been factoring climate change into its business decisions and investments since the early 1990s. In 2004, through EPA's Climate Leaders Program, PSEG voluntarily pledged to reduce its GHG emissions intensity by 18% from 2000 levels by 2008. PSEG surpassed this goal by achieving a 31% reduction.

The company is recognized for having one of the lowest carbon emission rates among the nation's largest power producers. PSEG's low intensity rate is due primarily to the fact that more than half of our power comes from nuclear generation. In addition, PSEG retired its NJ coal-fired units in 2017; in 2019, PSEG announced the agreement to sell its interest in Keystone and Conemaugh generation facilities in western Pennsylvania, with the remainder of the company's coal generating assets scheduled for early retirement; and has installed three highly efficient Combined- Cycle Gas units, and finally continues to invest in solar energy. PSEG will complete its exit from coal with the closure of Bridgeport Harbor Unit 3 in 2021.

In 2019, PSEG announced that PSEG is on track to cut its power fleet carbon emissions by 80%, from 2005 levels, by 2046. This goal continues PSEG's position among the energy sector's most progressive power providers.

Further, PSEG believes that the necessary advances will occur in such critical areas as public energy policy, carbon-capture technology and customer behavior that our generation fleet can achieve net-zero carbon emissions by 2050.

To achieve this goal:

• PSEG Power will retire or sell all remaining interests in coal-fired power plants, and has no plans to build or acquire new fossil-fueled generation;
• PSEG will continue to advocate for the preservation of PSEG's Salem and Hope Creek nuclear plants – the source of more than 90 percent of New Jersey's zero-carbon electricity; and
• PSEG will continue to explore opportunities in solar, offshore wind and emerging technologies, and continue to advocate for energy efficiency, which is the most valuable and cost effective action we can undertake for our customers and for the environment.

In October 2018, PSE&G filed its proposed Clean Energy Future (CEF) programs with the BPU, a six-year estimated $3.5 billion investment program covering four programs; (i) an Energy Efficiency (EE) program totaling $2.5 billion of investment designed to achieve energy efficiency targets required under New Jersey's Clean Energy law; (ii) an Electric Vehicle (EV) infrastructure program; (iii) an Energy Storage (ES) program and (iv) an Energy Cloud (EC) program which will include installing approximately two million electric smart meters and associated infrastructure. The parties in the CEF-EE filing have reached an agreement in principle that extends the discussion of the matter into

2020, and that authorizes, in the interim, PSE&G to continue work on four of its existing EE programs for an additional year. The agreement covering extension of both the CEF-EE matter and the four existing EE programs requires BPU approval. The CEF-EV/ES and CEF-EC programs will have separate procedural schedules.

Cost of management

4,600,000,000

Comment

The cost includes: $1.7 billion (enterprise-wide solar), $400 million (energy efficiency invested), and $2.5 billion (additional energy efficiency proposed).
Since 2005, PSE&G has invested over $900 million in solar energy and has installed 124 MWs of solar capacity with an additional 33 MW under construction. As with all utility programs this is an investment opportunity where PSE&G makes a return on equity (ROE) and recovers the debt.

Since 2005, PSEG Power has invested over $800 million in solar energy and has installed 414 MWs of solar capacity in the form of long term purchase power agreements.

PSE&G has invested nearly $400 million in a range of targeted energy efficiency programs. This is an investment opportunity where PSE&G makes a return on equity (ROE) and recovers the debt.

Consistent with New Jersey's recently enacted energy efficiency legislation, PSE&G has outlined a clean energy proposal to invest $3.5 billion over six years in energy efficiency and other programs that will reduce energy bills and combat climate change (the other three elements of the Clean Energy Future besides energy efficiency total $1 billion: $600M for EC-AMI, $300M for EV infrastructure and $100M for ES).

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

Type of financial impact

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

Company- specific description

The electric generating plants operated by PSEG Power are located in New Jersey, New York, Maryland and Connecticut. None of these plants are sited in a "water-stressed area". As a long-term corporate and industrial resident of the state, PSEG has a long history and deep culture as a steward of the water resources in the areas where we operate. We have consistently defined "water stress" using parameters that are more appropriate to the needs of our region: resource preservation and the protection of water quality.

Time horizon

Unknown

Likelihood

Exceptionally unlikely

Magnitude of impact

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

The impact has not been quantified financially

Management method

Geographic and demographic models project that the areas in which our plants are sited are not expected to be water stressed by definition for years into the future. Nevertheless, PSEG will continue to evaluate evolving impacts of our operations, continue to reduce the dependence of our production on water, and continue to work with local authorities to address water resource issues in future operation and development plans.

To reduce cooling water use from natural water bodies, we have minimized the use of once-through cooling water systems by using such conservation technologies as closed-cycle cooling, alternate sources such as recycled "gray water," zero liquid discharge, and treatment and recovery processes that return effluent water at the same or higher quality than our intake. Several of our plants use closed-cycle cooling systems that repeatedly recycle water instead of releasing it immediately into local waterways. In 2012, we repowered water-cooled units at our Kearny plant and New Haven plant with simple cycle

combustion turbine units that are air cooled and do not use cooling water. Retiring units that once required water for cooling have further reduced demands on the local water sources. New generation currently under construction employs combined cycle combustion technology with air-cooled condensers.

We also have contingency plans for periods of drought when water availability may be limited. PSEG Power and its two Delaware River generating plants are members of a power industry coalition that created Merrill Creek, a reservoir, nature preserve and watershed project whose purpose is to provide stored water that can be released to the Delaware River to make up for evaporative water loss, by generating plants during times of declared drought conditions and mitigate migration of the salt line that impacts water intakes for communities in the region.

Cost of management

$159,000,000

Comment

The cost of management amount reflects the total cost of the Merrill Creek Project

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Identifier

Risk 5

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact

Reduced revenue from decreased demand for goods/services

Company- specific description

PSEG believes that climate change is the preeminent challenge of our time and with it comes significant business opportunities and responsibilities. As a leader in low-carbon energy, PSEG has long advocated for federal legislation to limit and reduce GHG emissions. Absent a comprehensive legislative solution, we have supported the steps taken by states to reduce GHGs. PSEG has been factoring climate change into its business decisions and investments since the early 1990s.

In 2018, PSEG introduced its “Powering Progress” vision for the future of our company – a future in which we help our customers use less energy, ensure that the energy they use is cleaner and greener, and deliver that energy more reliably than ever before.

In 2019, PSEG introduced a significant extension of the “Powering Progress” vision: announcing that PSEG is on track to cut its power fleet carbon emissions by 80%, from

2005 levels, by 2046. This goal continues PSEG's position among the energy sector's most progressive power providers.

Further, PSEG believes that the necessary advances will occur in such critical areas as public energy policy, carbon-capture technology and customer behavior that our generation fleet can achieve net-zero carbon emissions by 2050.

Time horizon

Unknown

Likelihood

Very unlikely

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)

USD

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

None at the moment

Management method

As a leader in low-carbon energy, PSEG has long advocated for federal legislation to limit and reduce GHG emissions. Absent a comprehensive legislative solution, we have supported the steps taken by states to reduce GHGs. PSEG has been factoring climate change into its business decisions and investments since the early 1990s. In 2004, through EPA's Climate Leaders Program, PSEG voluntarily pledged to reduce its GHG emissions intensity by 18% from 2000 levels by 2008. PSEG surpassed this goal by achieving a 31% reduction. PSEG's low intensity rate is due primarily to the fact that more than half of our power comes from nuclear generation. In addition, PSEG retired its NJ coal-fired units in 2017 and invested in three highly efficient combined-cycle units, continues to invest in solar energy and considers other renewable investments like offshore wind.

Cost of management

4,600,000,000

Comment

The cost includes: $1.7 billion (enterprise-wide solar), $400 million (energy efficiency invested), and $2.5 billion (additional energy efficiency proposed).

Since 2005, PSE&G has invested over $900 million in solar energy and has installed 124 MWs of solar capacity with an additional 33 MW under construction. As of all of utility programs this is an investment opportunity where PSE&G makes a return on equity (ROE) and recovers the debt.

Since 2005, PSEG Power has invested over $800 million in solar energy and has installed 414 MWs of solar capacity in the form of long term purchase power agreements.

PSE&G has invested nearly $400 million in a range of targeted energy efficiency programs. This is an investment opportunity where PSE&G makes a return on equity (ROE) and recovers the debt.

Consistent with New Jersey's recently enacted energy efficiency legislation, PSE&G has outlined a clean energy proposal to invest $3.5 billion over six years in energy efficiency and other programs that will reduce energy bills and combat climate change.

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?

Customer

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Other

Type of financial impact

Reduced operating costs (e.g., through efficiency gains and cost reductions)

Company-specific description

In October 2018, PSE&G filed its proposed $3.5 billion Clean Energy Future (CEF) programs with the BPU that includes an Energy Efficiency (EE) program totaling $2.5 billion of investment designed to achieve energy efficiency targets required under New Jersey's Clean Energy law. The parties in the CEF-EE filing have reached an agreement in principle that extends the discussion of this matter into 2020, and that authorizes, in the interim, PSE&G to continue work on four of its existing EE programs for an additional year. The agreement covering extension of both the CEF-EE matter and the four existing EE programs was recently approved by New Jersey regulators.

Time horizon

Current

Time horizon

Current

Likelihood

Very likely

Magnitude of impact

Medium-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

In October 2018, PSE&G filed its proposed Clean Energy Future (CEF) programs with the BPU, a six-year estimated $3.5 billion investment program that included an Energy Efficiency (EE) program totaling $2.5 billion of investment designed to achieve energy efficiency targets required under New Jersey's Clean Energy law.

Strategy to realize opportunity

In May 2018, the New Jersey governor signed legislation that requires the state's electric and gas utilities to implement energy efficiency programs that are expected to achieve energy savings targets for electric and gas usage within five years of the utility's implementation of its BPU-approved energy efficiency programs. To meet these savings

targets, energy usage reductions and peak demand reductions that result from utility and non-utility based programs and investments (including building code changes) will be counted. The specific energy savings target for each public electric and gas utility will be determined from an energy efficiency study to be completed within a year from enactment of the legislation. PSE&G is currently seeking approval for its proposed CEF program, a six-year estimated $3.5 billion investment program focused on achieving New Jersey's energy efficiency (EE) targets, supporting electric vehicle infrastructure, deploying energy storage, and implementing an energy cloud program. The procedural process for the CEF-EE program is expected to conclude by early 2020.

Cost to realize opportunity

2,900,000,000

Comment

Cost reflects the EE component of the CEF filing plus $400 million PSE&G has invested in a range of targeted energy efficiency programs to date.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Type of financial impact

Returns on investment in low-emission technology

Company-specific description

We recognize the urgent need for rapid, reliable and affordable expansion of renewable resources. We actively support New Jersey's efforts to become a national leader in offshore wind and are a leading developer of solar resources, with PSE&G and PSEG Power having invested approximately $1.7 billion.

Time horizon

Short-term

Likelihood
Virtually certain

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)
Usd

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Strategy to realize opportunity
In order to support New Jersey's Energy Master Plan and the state's renewable energy goals, we have undertaken two major solar initiatives at PSE&G, the Solar Loan Program and the Solar 4All and Solar 4All Extension Programs. Since 2005, PSE&G has invested over $900 million in solar energy and has installed 124 MWs of solar capacity with an additional 33 MW under construction. As with all utility programs this is an investment opportunity where PSE&G makes a return on equity (ROE) and recovers the debt.

Since 2005, PSEG Power has invested over $800 million in solar energy and has installed 414 MWs of solar capacity in the form of long term purchase power agreements.

Cost to realize opportunity
1.700, 000,000

Comment
Cost: $900 million in solar energy PSE&G and $800 million in solar energy PSEG Power

Identifier
Opp3

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

The market for electric vehicles (EVs) has grown significantly and EV adoption will impact the future energy landscape and the evolving grid. PSEG has a unique opportunity to support customer demand for transport electrification through our EV business model that leverages our existing utility relationships to increase EV adoption. Increased use of electricity for transportation would increase demand for electricity, increasing the demand for power generation from our generating assets, as well as delivery services from our utilities and would decrease emissions from transportation, the largest source of emissions in the region.

Time horizon

Current

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

In October 2018, PSE&G filed its proposed Clean Energy Future (CEF) programs that includes an Electric Vehicle (EV) infrastructure program. The program would help residential customers install EV chargers, support Level 2 charging equipment

installations at places such as multifamily buildings, businesses, fleet facilities, municipal facilities and hotels/motels, and support the installation of fast chargers in corridor locations.

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Strategy to realize opportunity

CEF filing

Cost to realize opportunity

300,000,000

Comment

Cost refers to the $300 million proposed for EV as part of the Clean Energy Filing (CEF) programs. Final amount will reflect administrative costs of the program.

PSE&G already boasts the state's largest network of workplace charging stations and has partnered with EVgo to install public EV charging stations at several rest stops along the New Jersey Turnpike and Garden State Parkway. PSE&G has spent over $800,000 to date on EV charging infrastructure.

Identifier

Opp4

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Type of financial impact

Returns on investment in low-emission technology

Company-specific description

In January 2018, the Governor of New Jersey signed Executive Order No. 8 directing the BPU to begin the process of moving the state toward its 2030 goal of 3,500 MW of offshore wind energy generation. In connection with the bid submitted by Ocean Wind, LLC, a wholly owned subsidiary of Ørsted US Offshore Wind, referred to as the Ocean Wind project, PSEG agreed to provide energy management services and the potential

lease of land for use in project development. We also retained an option to acquire an equity interest in the project.

Time horizon

Short-term

Likelihood

Likely

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

In June 2019, the New Jersey BPU granted the state's first award for offshore wind to Ørsted's Ocean Wind 1,100 MW project. In connection with the bid submitted by Ocean Wind, LLC, a wholly owned subsidiary of Ørsted US Offshore Wind, referred to as the Ocean Wind project, PSEG agreed to provide energy management services and the potential lease of land for use in project development. PSEG also retained an option to acquire an equity interest in the project. If PSEG elects to acquire an equity interest, PSEG would be required to incur additional capital expenditures. The amount of such capital expenditures, if any, cannot be determined at this time.

Strategy to realize opportunity

BPU to establish Offshore Renewable Energy Certificate (OREC) to support 3,500 MW by 2030. NJ department Of Labor directed to develop job training programs to support OSW development

Cost to realize opportunity

Comment

None

Identifier

Opp5

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient production and distribution processes

Type of financial impact

Reduced operating costs (e.g., through efficiency gains and cost reductions)

Company-specific description

PSE&G is a long-time participant in EPA's Natural Gas STAR program, a voluntary initiative that encourages natural gas companies to adopt cost-effective technologies and practices that reduce methane emissions. Since 2014, PSE&G has reduced methane emissions 2.9% annually or a total of 65,000 million tons of CO2 equivalent (calculated using EPA Greenhouse Gas Reporting Program: Subpart W – Petroleum and Natural Gas Systems methodology (EPA Subpart W)). In 2016, PSE&G became a founding partner of EPA's Natural Gas STAR Methane Challenge by committing to replace 1.5% of PSEG's cast iron gas mains and associated service lines by 2021. Primarily, PSE&G has been reducing methane emissions through the replacement of old cast iron pipelines and services.

Time horizon

Current

Likelihood

Very likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)
Usd

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

$2.8 billion for the GSMP I and GSMP II programs.

Strategy to realize opportunity

GSMP I was approved by the BPU in late 2015. By June 2019, through GSMP I, we invested approximately $900 million to replace approximately 450 miles of cast iron and

unprotected steel gas mains and about 40,000 unprotected steel service lines to homes and businesses, including uprating of the mains to higher pressure. The mains and service lines were replaced with stronger, more durable plastic piping, reducing the potential for leaks and release of methane gas. The new elevated pressure system also includes the installation of excess flow valves on each gas service that automatically shut off gas flow if a service line is abruptly damaged, and better supports the use of high-efficiency appliances. In May 2018, PSE&G received approval for the Gas System Modernization Program II (GSMP II), an expanded, five-year program to invest $1.9 billion over five years beginning in 2019 to replace approximately 875 miles of cast iron and unprotected steel mains in addition to other improvements to the gas system.

Cost to realize opportunity

2.800,000,000

Comment

In May 2018, PSE&G received approval for our Gas System Modernization Program II (GSMP II), an expanded, five-year program to invest $1.9 billion beginning in 2019 to replace approximately 875 miles of cast iron and unprotected steel mains in addition to other improvements to the gas system.

Identifier

Opp6

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of new technologies

Type of financial impact

Increased capital availability (e.g., as more investors favor lower-emissions producers)

Company-specific description

All four of our solar storage projects serve a number of functions. Not only do they provide critical resiliency to important infrastructure around the state, but they also deliver clean solar energy to our electric customers while helping demonstrate just how useful solar storage technology can be in New Jersey. In each project, solar panels provide electricity directly to the grid for all customers to use, which helps ensure reliability of the entire system. In the event of a long-term outage, such as those that follow extreme weather like Hurricane Irene or Superstorm Sandy, the systems provide additional resiliency for critical public facilities: a hospital, a wastewater treatment plant and a warming station.

Projects like these demonstrate the flexibility of solar power when coupled with battery

storage technology. They provide valuable learning and insight as to how best to pair solar with storage, which will only grow more popular as the technologies become more efficient and affordable.

As battery storage technology improves, and the price of both solar panels and storage systems continue to fall, solar storage could become an increasingly popular option for utilities, large and small commercial customers, public facilities, and even homeowners.

Time horizon

Short-term

Likelihood

Likely

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

In October 2018, PSE&G filed its proposed Clean Energy Future (CEF) programs with the BPU that includes an Energy Storage (ES) program

Strategy to realize opportunity

PSE&G is proposing to spend $100 million on a variety of projects that would spur the development of energy storage resources in New Jersey. The proposal calls for building 35 megawatts of storage capacity over six years, creating about 300 jobs per year and representing a significant step toward realizing New Jersey Governor Phil Murphy's target of 2,000 megawatts of energy storage by 2030. Our proposed energy storage program would aid solar development, boost capacity on select electric lines and potentially defer the need for distribution system upgrades. It also would help us better manage power outages, reduce peak demands at substations that are under construction and allow critical facilities to maintain a reliable supply of electricity during extended power outages. Finally, the PSE&G energy storage proposal could help public sector facilities manage costs by reducing electric use at peak times.

Cost to realize opportunity

$100,000,000

Comment

Cost refers to the $100 million proposed for ES as part of the Clean Energy Filing (CEF) programs. Final amount will reflect administrative costs of the program.

C2.5

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

	Impact	Description
Products and services	Impacted	To support New Jersey's Energy Master Plan and the state's renewable energy goals, we have undertaken two major solar initiatives at PSE&G, the Solar Loan Program and the Solar 4All and Solar 4All Extension Programs. Our Solar Loan Program provides solar system financing to our residential and commercial customers. The loans are repaid with cash or solar renewable energy certificates (SRECs). We sell the SRECs received through periodic auctions and use the proceeds to offset program costs. Our Solar 4 All Programs invest in utility-owned solar photovoltaic (PV) centralized solar systems installed on PSE&G property and third-party sites, including landfill facilities, and solar panels installed on distribution system poles in our electric service territory. We sell the energy and capacity from the systems in the PJM wholesale electricity market. In addition, we sell SRECs generated by the projects through the same periodic auction used in the loan program, the proceeds of which are used to offset program costs. We have improved our utility operations by increasing our investments in transmission and distribution infrastructure projects, through Energy Strong and Gas System Modernization Programs I and II, designed to enhance system reliability and resiliency, meet our customers' expectations and support public policy objectives; Additionally, we have maintained and expanded a reliable, efficient, environmentally responsible and increasingly less carbon intensive generation fleet with the flexibility to utilize a diverse mix of fuels, allowing us to respond to market volatility and capitalize on opportunities. In April 2019, PSEG Power's Salem 1, Salem 2 and Hope Creek nuclear plants were awarded Zero Emission Certificates (ZECs) by the BPU. Pursuant to a process established by the BPU, ZECs are purchased from selected nuclear plants and recovered through a non-bypassable distribution charge in the amount of $0.004 per kilowatt-hour (which is equivalent to approximately $10 per megawatt hour (MWh) in payments to selected nuclear plants

		(ZEC payment)). These nuclear plants are expected to receive ZEC revenue for approximately three years, through May 2022, and will be obligated to maintain operations, subject to exceptions specified in the ZEC legislation. PSEG Power anticipates it will recognize revenue monthly as the nuclear plants generate electricity and satisfy their performance obligations. The ZEC legislation requires nuclear plants to reapply for any subsequent three year period.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	We have strong partnerships with many local and national environmental organizations, reflecting our commitment to the responsible management of natural resources across the full spectrum of our activities. Our efforts to protect the environment can be found throughout our organization and include longstanding initiatives such as our Estuary Enhancement Program, which has restored thousands of acres of marshlands in southern New Jersey and neighboring areas along Delaware Bay.
Adaptation and mitigation activities	Impacted for some suppliers, facilities, or product lines	PSE&G completed its BPU-approved Energy Strong Program I (ES I) in 2018 at an investment of $1 billion. Under ES I, PSE&G upgraded all of its electric substations that were damaged by water in recent storms; made investments that will create redundancy in the electric distribution system, reducing outages when damage occurs; and deployed technologies to better monitor system operations, enabling PSE&G to restore customers more quickly in the event of an electric outage. Concerning PSE&G's gas system, PSE&G completed the replacement and modernization of 240 miles of low-pressure cast iron gas mains in or near flood areas, upgraded five natural gas metering stations, two liquefied propane stations and a liquefied natural gas station affected by severe weather or located in flood zones. In 2018, PSE&G also essentially completed its Gas System Modernization Program (GSMP I), which was approved by the BPU in late 2015. By June 2019, through GSMP I, we have invested approximately $900 million to replace approximately 450 miles of cast iron and unprotected steel gas mains and about 40,000 unprotected steel service lines to homes and businesses, including uprating of the mains to higher pressure. The mains and service lines were replaced with stronger, more durable plastic piping, reducing the potential for leaks and release of methane gas. The new elevated pressure system also includes the installation of excess flow valves on each gas service that automatically shut off gas flow if a service line is abruptly damaged, and better supports the use of high-efficiency appliances. In May 2018, PSE&G received approval for the Gas System Modernization Program II (GSMP II), an expanded, five-year program to invest $1.9 billion over five years beginning in 2019 to replace approximately 875 miles of cast iron and unprotected steel mains in addition to other improvements to the gas system. In June 2018, we filed for

		our Energy Strong Program II (ES II). PSE&G has reached an agreement in principle with key parties in the ES II infrastructure filing that will enable the continuation of increasing the resiliency and improving the reliability of critical energy infrastructure in New Jersey. PSE&G is working with the New Jersey Board of Public Utilities staff, with Rate Counsel, and other parties on finalizing a stipulation of settlement, which was approved by New Jersey Board of Public Utilities September 2019. The agreement provides for $842 million of investment of projects beginning in the fourth quarter of this year and which are expected to be completed by December of 2023, providing an annual level of spend that is comparable to that of ES I.
Investment in R&D	Impacted for some suppliers, facilities, or product lines	PSEG is working hard to develop new, innovative approaches to environmental challenges. We have partnered with Google on the use of technology that helps us prioritize repairs as we modernize our gas distribution system – and thus substantially reduce methane leaks while improving service. As part of our innovative solar initiatives, we have a new solar battery storage project that will provide clean energy for a sewage treatment plant in West Caldwell, New Jersey, as well as backup power in the event of outages. We have been working with Nissan, among others, on efforts that encourage the adoption of electric vehicles. In addition, PSE&G is a member of ChargEVC, a not-for-profit coalition of automotive retailers, utilities, technology companies, local governments, environmental, community and labor advocates formed to identify programs and policies to accelerate electric vehicle growth in New Jersey.
Operations	Impacted	The evolution of electric technology also affords opportunities to reduce PSEG's emissions profile. We are transforming our generation fleet to be cleaner and more efficient while emphasizing the continued importance of fuel diversity to ensure reliable and affordable energy. The company is recognized for having one of the lowest carbon emission rates among the nation's largest power producers. PSEG's low intensity rate is due primarily to the fact that more than half of our power comes from nuclear generation. In addition, PSEG Power retired its NJ coal-fired units in 2017; in 2019, PSEG Power announced the sale of its interest in Keystone and Conemaugh coal-fired generation facilities in western Pennsylvania, with the remainder of the company's coal generating assets scheduled for early retirement in 2021; and we continue to invest in solar energy. In 2019, PSEG announced that PSEG is on track to cut its power fleet carbon emissions by 80%, from 2005 levels, by 2046. We believe that, with the necessary advances in technology,

		customer behavior and public policy, we can achieve our vision of attaining net-zero carbon emissions from our fleet by 2050.
Other, please specify	Impacted for some suppliers, facilities, or product lines	Change is a constant in our industry and our world. Our customers' demands are changing. They want energy that is more reliable, resilient and cleaner, along with better access to smart technology that can help them manage their energy use – all while keeping bills affordable. These demands not only present a huge, multi-dimensional challenge, but also create an unparalleled opportunity to build a model energy company of the future. A multi-dimensional challenge calls for a multi-level, strategic response. That is why we are moving ahead with major infrastructure modernization investments, enhancing the reliability and resiliency of our systems and building new, clean and efficient power plants. It is also why we have invested $1.7 billion to develop or finance solar power and put more than $400 million to work in helping hospitals, apartment buildings, government facilities and other customers make energy efficiency improvements that reduce their bills. Further, it requires action to deliver customer and technology solutions under the Clean Energy Future programs: Energy Efficiency, Electric Vehicle infrastructure, Energy Storage, and electric smart meters and associated infrastructure of the Energy Cloud.

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	Our business plan is designed to achieve growth while managing the risks associated with fluctuating commodity prices and changes in customer demand. We continue our focus on operational excellence, financial strength and disciplined investment. These guiding principles have provided the base from which we have been able to execute our strategic initiatives, including: • improving utility operations through growth in investment in T&D and other infrastructure projects designed to enhance system reliability and resiliency and to meet customer expectations and public policy objectives, and • maintaining and expanding a reliable generation fleet with the flexibility to utilize a diverse mix of fuels which allows us to respond to market volatility and capitalize on opportunities as they arise.

Operating costs	Impacted	We are subject to extensive federal, state and local environmental laws and regulations regarding air quality, water quality, site remediation, land use, waste disposal, the impact on global climate, natural resources damages and other matters. These laws and regulations affect the manner in which we conduct our operations and make capital expenditures. Changes in these laws, or violations of laws, could result in significant increases in our compliance costs, capital expenditures to bring our facilities into compliance, operating costs for remediation and clean-up actions, civil penalties or damages from actions brought by third parties for alleged health or property damages.
Capital expenditures / capital allocation	Impacted	We utilize rigorous investment criteria when deploying capital and seek to invest in areas that complement our existing business and provide reasonable risk-adjusted returns. These areas include upgrading our energy infrastructure, responding to trends in environmental protection and providing new energy supplies in domestic markets with growing demand. In 2018 and 2019, we: • made additional investments in transmission infrastructure projects, • continued to execute our GSMP, Energy Strong, Energy Efficiency, solar and other existing BPU-approved utility programs, • completed construction of our Bridgeport Harbor 5, Keys and Sewaren 7 generation projects, and • acquired six solar energy projects in various states totaling 88 MW-direct current (dc), for a total of 414 MW (dc) of installed capacity in 14 states throughout the U.S.
Acquisitions and divestments	Impacted for some suppliers, facilities, or product lines	Our primary investment opportunities are in two areas: our regulated utility business and our merchant power business. We continually assess a broad range of strategic options to maximize long-term stockholder value. In assessing our options, we consider a wide variety of factors, including the performance and prospects of our businesses; the views of investors, regulators and rating agencies; our existing indebtedness and restrictions it imposes; and tax considerations, among other things. Strategic options available to us include: • the acquisition, construction or disposition of T&D facilities and/or generation units, • the disposition or reorganization of our merchant generation business or other existing businesses or the acquisition or development of new businesses, • the expansion of our geographic footprint, • continued or expanded participation in solar, offshore wind, demand response and energy efficiency programs, and

		• investments in capital improvements and additions, including the installation of environmental upgrades and retrofits, improvements to system resiliency, modernizing existing infrastructure and participation in transmission projects through FERC's "open window" solicitation process.
Access to capital	Impacted	We expect that all of our capital requirements over the next three years will come from a combination of internally generated funds and external debt financing.
Assets	Impacted	Our investments in Keys Energy Center (Keys), Sewaren 7 and Bridgeport Harbor Station 5 (BH5) reflected our recognition of the value of opportunistic growth in the Power business.
Liabilities	Impacted	In December 2018, Power completed the sale of the sites of the retired Hudson and Mercer units. Power transferred all land rights and structures on the sites to a third-party purchaser, along with the assumption of the environmental liabilities for the sites. In June 2019, PSEG Power agreed to sell its interest in the Keystone and Conemaugh generation facilities in western Pennsylvania and related assets, including the assumption of related liabilities. The transaction is expected to close during the second half of 2019, subject to customary closing conditions and regulatory approvals. With this announcement, PSEG Power eliminates a non-core asset and is one-step closer to a fleet with no coal units, with the remainder of the company's coal generating assets either sold or scheduled for early retirement.
Other		None

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.

PSEG believes that climate change is the preeminent challenge of our time and with it comes significant business opportunities and responsibilities. Inclusion of many aspects surrounding climate change in our business plans has been a part of the PSEG culture since 1990. As new challenges arise, we have adapted our business plans to develop cost-effective solutions meet these challenges. New Jersey has long sought to develop an over-arching, forward-looking energy policy. The state published its first Energy Master Plan (EMP) in 1991. The development of the EMP included input from a diverse group of stakeholders, including PSEG. The plan included policy positions and implementation strategies to meet the state's energy requirements through the year 2000. One of the initial state energy policy goals was "to protect our environment through wise and efficient energy use." In particular, the EMP encouraged the development of cost-effective solar energy and demand-side energy efficiency. PSEG embraced the goals of the EMP and actively sought actions to support these goals. In parallel, the United States embraced a leadership role in developing strategies to address climate change when it signed onto the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. The objective of the UNFCCC treaty was to stabilize greenhouse gas emissions to 1990 levels by the year 2000. PSEG accepted the challenge and was the first electric utility in the United States to volunteer to participate in President Clinton's Climate Challenge Program in 1993. Our participation in the Climate Challenge Program was one mechanism to support New Jersey's goals under the EMP. We successfully met this goal and stabilized our carbon dioxide (CO2) emissions from our New Jersey plants to 1990 levels by 2000. PSEG sought additional opportunities to reduce our carbon footprint. PSE&G signed on to EPA's voluntary Natural Gas STAR Program in 1993. The Natural Gas STAR Program is designed to promote the implementation of cost-effective technologies and practices to reduce CH4 emissions. In addition, PSEG joined EPA's Waste Wise Program in 1995. Under this program, partners demonstrate how they reduce waste and incorporate sustainable materials management into their waste-handling processes. The program provides a tool to calculate GHG emission reductions associated with recycling and waste minimization activities. PSEG's recycling rates have consistently exceeded 90 percent. Since the UNFCCC entered into force, the member countries continue to meet annually to assess the progress in addressing climate change. In December 1997, the member countries reached agreement on the Kyoto Protocol on Climate Change. The Clinton Administration committed to a requirement to reduce total emissions on average of 7% below 1990 levels; however, Congress never ratified the treaty. Nevertheless, PSEG continued to acknowledge the electric utility industry's need to

play a leadership role in developing national strategies to address climate change. Building on the success of the Global Climate Challenge Program, PSEG joined EPA's Climate Leaders program in 2002 to reduce the six greenhouse gases (GHGs) covered under the Kyoto Protocol – CO2, methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6). Under this program, PSEG committed to reduce its CO2 equivalent GHG emissions on a pound per megawatt-hour basis by 18% from 2000 levels by December 31, 2008. PSEG surpassed this goal by achieving a 31% reduction, due primarily to the fact that more than half our power comes from nuclear generation. New Jersey continued to be a leader in addressing climate change. Governor Corzine executed Executive Order No. 54, which established goals to reduce GHG emissions by 80% below 2006 levels by 2050. The passage of the Global Warming Response Act of 2007 (GWRA) supports the implementation of key elements of the Executive Order. As a leader in the energy industry and responsible corporate citizen, PSEG established a new goal of reducing economy-wide GHG emissions by 25% from 2005 levels by 2025. PSEG met this goal 14 years ahead of schedule. We achieved this goal through implementation of energy efficiency programs, deployment of renewable energy, increasing nuclear output and building clean, and efficient natural gas plants. This transformation of the energy business in a cost-effective manner requires heightened collaboration with the state. Utilities can deploy capital over the long term to ensure conservation and renewable energy gains are sustained. Funding mechanisms are necessary to ensure utilities realize a fair return on investments. Between 2008 and 2012 PSEG implemented the following:

- Received approval from NJBPU for PSE&G's Solar Loan program which aids businesses and homeowners in financing solar panel installations;
- Received approval from NJBPU for PSE&G's Solar 4All program to develop 158 megawatts of grid-connected solar capacity;
- Invested in grid-connected solar capacity outside of PSE&G's territory;
- Received approval from NJBPU for several targeted energy efficiency programs;
- Received approval from NJBPU to replace portions of PSE&G's old cast iron and unprotected steel gas mains (Gas System Modernization Program (GSMP));
- Replaced our auto fleet with hybrids and introduced the nation's first hybrid bucket trucks;
- Implemented Employee Workplace Charging Programs for PSEG employees and other employers in the PSE&G territory;
- Lowered our carbon footprint by making several of our facilities more energy efficient through utilization of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating;
- In 2012, New Jersey was hit by Superstorm Sandy. The storm's ferocity revealed the vulnerability of our infrastructure to damage from severe storms. This event prompted PSEG to consider climate change adaptation into our business plans in addition to mitigation
- PSE&G received approval from NJBPU to invest in resilient electricity and natural gas infrastructure in the wake of Superstorm Sandy (Energy Strong Program);

Experience has shown us that developing and implementing integrated energy and environmental policies to achieve the necessary deep reductions in GHG emissions to properly address climate change requires leadership and a long-term commitment. As stated above, we have adapted our business plans to meet the short-term goals to implement cost-effective measures to mitigate and adapt to climate change. PSEG has been and continues to be ready

to partner with state, regional and federal representatives to tackle the greatest environmental challenge of our time.

Recently, PSEG announced its commitment to reduce GHG emissions from its power generation fleet by 80% below our 2005 levels by 2046. In addition, we have a vision of attaining net-zero by 2050.

PSEG understands that there are uncertainties to the long-term strategic planning process that include market forces, technology innovation and commercialization, consumer preference and public policy. PSEG will continue to work collaboratively with policymakers, regulators, customers and the environmental community to provide safe, reliable, affordable clean energy.

C3.1d

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

Climate-related scenarios	Details
	PSEG does not review its business strategy in the context of any of the aforementioned climate-related scenarios but does review / stress-test its business strategy related to alternative industry outcomes. PSEG has already adjusted its business strategy in reaction to increasingly aggressive federal and state public policies related to climate change. While PSEG has developed qualitative and quantitative scenarios to test how robust its business strategy would be under alternative industry outcomes, these have not been directly tied to any of the aforementioned climate-related scenarios. PSEG does subscribe to leading industry consultants (e.g. IHS Markit and Wood Mackenzie) who develop their own industry scenarios, which in part are driven by public policy and macro trends related to climate change. PSEG has used these consultant reports and market forecasts to develop more quantitative "what ifs" and stress-testing around topics such as low gas prices and carbon pricing (i.e. carbon penalties for coal generation plants).

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.

PSEG believes that climate change is the preeminent challenge of our time and with it comes significant business opportunities and responsibilities. As a leader in low-carbon energy, PSEG has long advocated for federal legislation to limit and reduce GHG emissions. Absent a comprehensive legislative solution, we have supported the steps taken by states to reduce GHGs. PSEG has been factoring climate change into its business decisions and investments since the early 1990s. In 2004, through EPA's Climate Leaders Program, PSEG voluntarily pledged to reduce its GHG emissions intensity by 18% from 2000 levels by 2008. PSEG surpassed this goal by achieving a 31% reduction. PSEG's low intensity rate is due primarily to the fact that more than half of our power comes from nuclear generation.

Subsequently, PSEG established a goal of reducing GHG emissions by 25% from 2005 levels by 2025. In 2011, PSEG met that goal 14 years ahead of schedule. PSEG achieved these goals through implementation of energy efficiency programs, deployment of renewable energy, increasing nuclear output and building clean, efficient natural gas plants. PSEG continues to build on this success to further reduce emissions and provide more low-carbon energy.
In 2018, PSEG announced its new goal of eliminating 13 million metric tons of CO2-equivalent (MMTCO2e) by 2030 from 2005 levels. This goal included the following actions:

- Retirement of our New Jersey and Connecticut coal plants;
- Accounting for avoided emissions from the post-2005 uprates at our nuclear facilities;
- Efficiency upgrades of our existing natural gas combined cycle fleet;
- PSE&G's Gas System Modernization Program, which by replacing old cast-iron pipes with new plastic helps prevent methane leaks;
- Continued replacement of traditional fleet vehicles with hybrid vehicles and the installation of idle mitigation technology on fleet vehicles;
- Solar and energy efficiency investments and programs;
- Electric vehicle charging programs for our employees and our commercial/industrial customers;
- Recycling of industrial waste under EPA's Waste Wise program; and
- Emission reductions in fulfilling PSEG Power's REC commitments.

Because PSEG believes that greater carbon reductions can be achieved with the right technology and supportive public policy advances over the next 30 years, the company established its vision of net-zero carbon emission by 2050. PSEG already is New Jersey's largest supplier of low- and zero-carbon electricity and energy-saving solutions and has a long history of addressing climate change as an embedded part of its business and culture including: PSEG's emission rate in 2017 was 461 lb/MWh, below the International Energy Agency's (IEA) "Beyond 2C Scenario" 2030 projected CO2 emission rate for the U.S. electric sector of 510 lb/MWh. . By 2021, PSEG Power will have retired or exited through sales more than 2,400 MW of coal-fired generation, thus eliminating coal-fired generation entirely from its fleet.

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+2 (location-based)

% emissions in Scope
100

Targeted % reduction from base year
25

Base year
2005

Start year
2009

Base year emissions covered by target (metric tons CO2e)
26,566,330

Target year
2025

Is this a science-based target?
No, and we do not anticipate setting one in the next 2 years

% of target achieved
100

Target status
Achieved

Please explain
In 2009, PSEG established a goal of reducing GHG emissions by 25% from 2005 levels by 2025. In 2011, PSEG met that goal 14 years ahead of schedule.

Target reference number
Abs 2

Scope
Scope 1+2 (location-based)

% emissions in Scope

100

Targeted % reduction from base year

50

Base year

2005

Start year

2017

Base year emissions covered by target (metric tons CO2e)

26,566,330

Target year

2030

Is this a science-based target?

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

% of target achieved

100

Target status

Achieved

Please explain

Eliminated Emissions goal of 13 million metric tons of CO2e from 2005 levels by 2030. The new goal expands on the previous goal by including avoided emissions through various programs. The Eliminated Emissions goal includes, but is not limited to the following activities: Permanent retirement of our coal units at Bridgeport, Hudson and Mercer • Efficiency upgrades at our existing natural gas combined cycle fleet • Replacement of aging cast iron natural gas distribution pipelines with new plastic pipe • Continued replacement of traditional fleet vehicles with hybrid vehicles • Implementation of idle mitigation technology on fleet vehicles • Accounting for avoided emissions from our electric vehicle charging programs for our employees and our commercial/industrial customers • Accounting for avoided emissions from our recycling of industrial waste under EPA's Waste wise program • Accounting for avoided emissions from PSEG Power's REC commitments • Accounting for avoided emissions for post-2005 uprates at our nuclear facilities • Accounting for avoided emissions from our solar programs, both in the utility and the merchant power business units • Accounting for avoided emissions from energy efficiency programs implemented through both our electric and gas businesses.

Target reference number

Abs 3

Scope

Scope 1

% emissions in Scope

100

Targeted % reduction from base year

80

Base year

2005

Start year

2019

Base year emissions covered by target (metric tons CO2e)

26,566,330

Target year

2046

Is this a science-based target?

No

% of target achieved

0

Target status

Underway

Please explain

PSEG recently introduced a significant extension of the “Powering Progress” vision: Announcing that PSEG is on track to cut its power fleet carbon emissions by 80 percent, from 2005 levels, by 2046. This goal continues PSEG’s position among the energy sector’s most progressive power providers.

PSEG believes that the necessary advances will occur in such critical areas as public energy policy, carbon-capture technology and customer behavior that our generation fleet can achieve net-zero carbon emissions by 2050.
To achieve this goal:
• PSEG Power will retire or sell all remaining interests in coal-fired power plants, and has no plans to build or acquire new fossil-fueled generation;
• PSEG will continue to advocate for the preservation of PSEG’s Salem and Hope Creek nuclear plants – the source of more than 90%of New Jersey’s zero-carbon electricity; and
• PSEG will continue to explore opportunities in solar, offshore wind and emerging technologies, and continue to advocate for energy efficiency, which is the most valuable action we can undertake for our customers and for the environment.

As we share our vision for net-zero carbon emissions by 2050, we also recognize that there is no single magic bullet that can get us to a 100 percent carbon-free future, but rather a combined effort across the economy. The energy industry has always relied on innovation, efficiency, smart policies and an all-of-the above strategy to address its

greatest challenges. Succeeding in a carbon-constrained future will not be any different. PSEG's new net-zero goal is the latest step in our company's approach not only to address the realities of climate change, but also to evolve our business to meet our customers' demands for clean energy.

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	4	10,000,000
To be implemented*	2	52.9 - 2018 PJM average – 924 lbs/MWh
Implementation commenced*	1	13 - 2018 PJM average – 924 lbs/MWh
Implemented*	4	645,378
Not to be implemented	0	0

C4.3b

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

C4.3c

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

Method	Comment

Compliance with regulatory requirements/standards	For PSE&G, since the electric rates are regulated, the Company can only pass along costs to customers for activities that are deemed economically prudent or mandated by law. For PSEG Power, the regulations governing emissions from existing electric generators, and the value of alternative or low carbon sources of energy, could drive significant investment in the future.
Dedicated budget for energy efficiency	In May 2018, the New Jersey Governor signed legislation that requires the state's electric and gas utilities to implement energy efficiency programs that are expected to achieve energy savings targets for electric and gas usage within five years of the utility's implementation of its BPU-approved energy efficiency programs. To meet these savings targets, energy usage reductions and peak demand reductions that result from utility and non-utility based programs and investments (including building code changes) will be counted. Energy Efficiency 2017 Program (EE 2017)—In August 2017, the BPU approved PSE&G's petition for EE 2017 to extend three existing energy efficiency subprograms (multi-family, direct install and hospital efficiency) and establish two new residential energy efficiency offerings. The two new offerings include deployment of smart thermostats and a pilot program to provide residential customers with energy usage information enabling them to reduce consumption. EE 2017, as approved, allows PSE&G to extend the subprogram offerings and establish the residential energy efficiency sub-programs under its existing energy efficiency clause recovery process. The EE 2017 allows for $69 million of additional investment and $16 million of additional administrative and information technology costs. EE 2017 was added as the eleventh component of the Green Program Recovery Charges (GPRC) rate effective September 1, 2017. The Energy Efficiency component of PSE&G's Clean Energy Future filing remains pending before the New Jersey Board of Public Utilities. We have reached an agreement in principle that extends the discussion of this matter into 2020 in anticipation of finalization of the state's Energy Master Plan that authorizes in the interim PSE&G to continue work on four of its existing award winning energy efficiency programs for an additional year.
Dedicated budget for low-carbon product R&D	Examples are "Smart" electric vehicle infrastructure: residential, workplace, multi-family, travel corridors •Battery Storage: Utility-scale systems to defer traditional distribution investment, enable additional solar, and enhance critical infrastructure resiliency
Dedicated budget for other emissions reduction activities	Funds are allocated specifically for emissions reduction initiatives, including building energy efficiency, fugitive emissions reductions, pipeline upgrades, and the purchase of alternative-fuel fleet vehicles.

Employee engagement	Different programs available such as “Workplace Charging”, share rides, employee giving and volunteer opportunities with our environmental partners.
Financial optimization calculations	All investments are optimized using a carbon price and other assumptions related to regulatory risk, including those presented by carbon.
Internal price on carbon	PSEG uses an internal price of carbon in all generation planning decisions, which influences and encourages investment in low-carbon generation and divestment of high-carbon generation
Other Advocacy	In April 2019, PSEG Power’s Salem 1, Salem 2 and Hope Creek nuclear plants were awarded Zero Emission Certificates (ZECs) by the New Jersey Board of Public Utilities (BPU). These nuclear plants are expected to receive ZEC revenue for approximately three years, through May 2022, and will be obligated to maintain operations, subject to exceptions specified in the ZEC legislation. PSEG Power anticipates it will recognize revenue monthly as the nuclear plants generate electricity and satisfy their performance obligations. The ZEC legislation requires nuclear plants to reapply for any subsequent three-year period.

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

Group of products

Description of product/Group of products

Utility Customer, Energy Efficiency Programs

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

MWh avoided times regional emissions

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

Comment

Assisting customer in reducing their electric use and overall peak demand on the system through coordinated educational programs and energy efficiency products and services.

Level of aggregation

Group of products

Description of product/Group of products

Renewable and Low Emissions Electric Generation

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

Low-carbon product and avoided emissions

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

Other, please specify

MWh generation times national average

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

Comment

Solar Interconnection Process: PSE&G has supportive interconnection policies for distributed energy resources (DERs) including solar energy projects. To date, PSE&G has more than 1,000 MW of solar installed in its territory, and the interconnection process takes no more than 15 to 20 business days. While most utilities restrict solar energy penetration to 15% of the rate capacity on a circuit, PSE&G has adopted far more aggressive policies by allowing 50% of a circuit's capacity to be saturated with solar, and all residential solar projects are permitted to interconnect to the grid regardless of the amount of solar saturation on a specific circuit. Other policies have also been implemented to support solar adoption in PSE&G territory including, changes to the power factor guidelines to support solar energy on heavily saturated circuits, that shows the ability of the local distribution to accept solar energy, a concierge service for customers to work directly with PSE&G's interconnection experts to better understand the interconnection feasibility of the proposed project, and the development of an on-line portal where customers are able to apply for interconnection and check the status of their project. These policies combine to make PSE&G one of the most progressive utilities in the country for supporting solar energy projects.

Level of aggregation

Group of products

Description of product/Group of products

Development of Renewable Distributed Generation Systems

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

Low-carbon product and avoided emissions

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

Other, please specify

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

Comment

Siting and construction of distributed generation for customers including creative financing options and coordination with meeting their electricity needs.

C-EU4.6

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

PSE&G is investing in resilient electricity and natural gas infrastructure and has agreed to implement a $1 billion program in the wake of Superstorm Sandy. This effort, titled Energy Strong, includes the replacement and modernization of 250 miles of low-pressure cast-iron gas mains and the deployment of smart grid technologies. Both of these projects will aid our ongoing efforts to lower GHG emissions. In addition, PSE&G is in the process of replacing up to 450 miles of gas mains and, 40,000 service lines that began in 2016 and will run through 2019 under its Gas System Modernization Program (GSMP). Aging cast iron pipes will be replaced with strong, durable plastic piping, which is much less likely to have leaks and release methane gas. Replacement of the pipelines will be prioritized through a joint methane emissions study with the Environmental Defense Fund (EDF). In May 2018, the NJBPU approved PSE&G's extension of the GSMP ("GSMP II"). GSMP II is a five-year program to replace up to 875 miles of cast iron and unprotected steel mains and related service lines. PSE&G will use the prioritization as used in GSMP to maximize methane emission reductions.

PSE&G is a long-time participant in EPA's Natural Gas STAR program, a voluntary initiative that encourages natural gas companies to adopt cost-effective technologies and practices that reduce methane emissions. In 2016, PSE&G became a founding partner of EPA's Natural Gas STAR Methane Challenge by committing to replace 1.5 percent of PSEG's cast iron gas mains and associated service lines by 2021.

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)
24,898,116

Comment
None

Scope 2 (location-based)

Base year start
January 1, 2005

Base year-end
December 31, 2005

Base year emissions (metric tons CO2e)
1,668,214

Comment
None

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
n/a

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 Climate Registry: Electric Power Sector (EPS) Protocol
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)

13,684,640

Start date

January 1, 2018

End date

December 31, 2018

Comment

Output changed due to the new Combined Cycle units that started operations in 2018, additional general demand for electricity grew. Finally, Oyster Creek nuclear unit retired which caused a change in the output and emissions profile of the grid.

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 have no operations where we are able to access electricity supplier emission factors or residual emissions factors and are unable to report a Scope 2, market-based figure

Comment

None

C6.3

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

Reporting year

Scope 2, location-based

965,720

Start date

January 1, 2018

End date

December 31, 2018

Comment

Our own facility electricity and gas use increased in 2018.

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

Relevant, calculated

Metric tonnes CO2e

Emissions calculation methodology

WRI Economic Input Output. We categorize our spend data into capital goods (c), materials (m), and services (s). The PSEG Managed Categories were further sorted into type of spend based on the economic input-output (EIO) model categorization. All spend that represented 0.01% and above was considered material.

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

10

Explanation

PSEG's spend on purchased goods and services excludes fuels for the year 2018

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

Emissions calculation methodology

WRI Economic Input Output. We categorize our spend data into capital goods (c), materials (m), and services (s). The PSEG Managed Categories were further sorted into type of spend based on the economic input-output (EIO) model categorization. All spend that represented 0.01% and above was considered material.

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

Explanation

PSEG spend on capital goods was primarily related to equipment required for the business for the year 2018.

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

Evaluation status

Relevant, calculated

Metric tonnes CO2e

Emissions calculation methodology

The fuel-and-energy related activities data is collected and calculated for coal, nuclear, and natural gas. The source of the data and the specific methodology for each of these sources are as follows: 1.) Coal - PSEG tracks the monthly shipments of coal arriving at the facility. The calculation of GHG includes: i.) For the Conemaugh and Keystone sites, GHG emissions associated with mining and rail transportation from Pennsylvania coal mines; ii.) For the Bridgeport site, GHG emissions associated with mining, trucking, barge and shipping from Indonesia coal mines to Bridgeport. 2.) Nuclear - PSEG tracks the electricity generated from nuclear. This was converted to GHG emissions using emissions factors for mining and milling, conversion, enrichment, fuel fabrication of uranium (also known as front-end process). 3.) PSEG collects and tracks the natural gas delivered by suppliers on a monthly basis. This was used to estimate the well to wheel (well to site) emissions associated with natural gas production. Across all of the fuel types, assumptions were made for the transportation of fuels to PSEG.

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

10

Explanation

PSEG's fuel and energy related activities not captured as part of Scope 1 and 2 GHG emissions include upstream emissions associated with the purchase of coal and natural gas fuels. Fuel and energy related activities are a significant source of Scope 3 emissions since it incorporates transportation and disposal of some of our fuels.

Nuclear fuels are excluded from these calculations because there is limited information available on upstream GHG emissions.

Upstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

PSEG's supply chain primarily consists of upstream purchased electricity and natural gas. Energy use and losses in transporting electricity and natural gas is accounted for in our Scope 1 and Scope 2 emissions. The other material transportation and distribution emissions upstream are captured in Scope 3: Fuel-and-energy-related activities (not included in Scope 1 or 2) (Category 3). Therefore, the emissions associated with upstream transportation and distribution are zero.

Waste generated in operations

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

Emissions calculation methodology

PSEG collects data on the volume of waste generated by our utility and other business. This information is converted to GHG emissions using the EPA Warm v14 tool. In this tool, the total waste by disposal method is converted to GHG emissions using average waste treatment specific emissions factors. GHG emissions from waste was only calculated for wastes that are material (i.e. greater than 0% of total waste volumes by disposal method type). This estimation only includes emissions from waste that is landfilled or incinerated. The emissions resulting from recycled material or wastewater are not included in accordance with the Scope 3 Guidance. The EPA Warm Tool uses life cycle emissions to estimate emissions from recycled material. This emission factor is therefore "negative." However, Scope 3 guidance recommends that the emissions from recycled material are accounted by the company that buys recycled material. Emissions from recycled material are not included. The Scope 3 guidance provides that recycled material should only be included for material recovery only if these are not included in the

emission factor for the material purchased by a company using these specific materials. Therefore, to avoid double counting, emissions from the recycling process should be included in the recycled material emission factor and reported by the company using recycled material. Emissions from wastewater are also not included as utilities are not included according to the Scope 3 Guidance. Although the WARM Tool provides what the avoided emissions from recycling would be, the Scope 3 Guidance recommends that companies should only report avoided emissions if they are able to provide data to support that the emissions were avoided (i.e. that their materials were collected, recycled, and used to create new products).

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

Explanation

GHG emissions associated with waste are not material and only represent 0% of our Scope 3 inventory. PSEG has set the threshold for Scope 3 materiality at 1% of Scope 3 emissions.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

3,293

Emissions calculation methodology

PSEG collects data on expenditures from airfare, bus, fuel, mileage, taxi, and trains. (GHG emissions from business travel). This expenditure in dollars was used as an input to the economic input output model to estimate GHG emissions

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

Explanation

GHG emissions associated with business travel are not material and only represent 0% of our Scope 3 inventory. PSEG has set the threshold for Scope 3 materiality at 1% of Scope 3 emissions.

Employee commuting

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

Emissions calculation methodology

PSEG publicly reports data on employees by state for the primary locations. In 2018, PSEG had approximately 13,145 full time employees, with around 74% based in our NJ offices; 18% based in our Uniondale, NY offices; and the rest based in our offices elsewhere. Average mode-type and mileage were extrapolated from this using the 2016 US Census Data and National Household Travel Survey to make assumptions about commuting types and distance associated with single-person, carpooling and public commuting. This information was converted into GHG emissions using emission factors from the US EPA Climate Leadership 2016 Direct Emissions from Mobile Combustion Sources and the GHG Protocol's Mobile Combustion v2.6 Average.

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

Explanation

Light Rail, Tram and Subway
GHG emissions associated with employee commuting are not material and only represent 0% of our Scope 3 inventory. PSEG has set the threshold for Scope 3 materiality at 1% of Scope 3 emissions.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

PSEG assets are directly managed by PSEG and are included in Scope 1 and 2 GHG emissions. PSEG does not have any upstream leased assets, therefore GHG emissions from this source are zero (0).

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

PSEG is an energy company delivering energy through the grid and pipelines. We capture losses associated with the downstream transportation and distribution of energy through the grid and pipelines in our Scopes 1, 2 and 3: Category 3: Fuel-and-energy related activities (not included in Scope 1 or 2); therefore, GHG emissions from this source are zero (0).

Processing of sold products

Evaluation status

Not relevant, explanation provided

Explanation

PSEG is an energy company focused on providing safe, reliable, economic and green energy; our activities are focused on the delivery of energy through the grid and pipelines. We do not sell any processing of intermediate products, therefore GHG emissions from this source are zero (0).

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

11,410,926

Emissions calculation methodology

PSEG is required to report GHG emissions that would result from the complete combustion or oxidation of the natural gas we purchase and sell to our customers under the EPA Greenhouse Gas Reporting Program (GHGRP) Subpart NN. The emissions from end users excluding companies in our corporate umbrella are estimated in the Subpart NN. We have subtracted out the emissions from companies in our corporate umbrella from the emissions that are reported in Subpart NN to ensure that we do not double count. The amount of gas that we receive in our system is higher than the amount of natural gas sold or disbursed to end users.

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

Explanation

This is our most significant source of Scope 3 emissions as we provide natural gas to end users. This estimate does not include the emissions from electricity that is transmitted using PSEG lines but not generated by PSEG.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Explanation

PSEG provides energy directly to customers and they are accounted for in Scope 3: Use of sold products (Category 11). We promote energy efficiency products and the GHG emissions associated with those products are captured as part of Scope 3: Purchased goods and services (Category 1). Therefore, the GHG emissions from this source are zero (0).

Downstream-leased assets

Evaluation status

Not relevant, explanation provided

Explanation

PSEG assets are directly managed by PSEG and are included in Scope 1 and 2 GHG emissions. PSEG does not have any downstream leased assets; therefore, GHG emissions from this source are zero (0).

Franchises

Evaluation status

Not relevant, explanation provided

Explanation

PSEG does not have any franchise agreements; therefore, Scope 3 GHG emissions associated with PSEG franchise related
activities are zero (0).

Investments

Evaluation status

Not relevant, explanation provided

Explanation

PSEG uses the equity approach for assets over which PSEG exercises operational and/or financial control. Where PSEG has co-owns a facility, the emissions are apportioned to the Scope 1 and 2 inventory by percentage ownership. Any emissions associated with our investments are captured in our Scope 1 and 2 GHG emissions. Therefore, Scope 3 GHG emissions associated with PSEG investment related activities are zero (0).

Other (upstream)

Evaluation status

Not relevant, explanation provided

Explanation

PSEG does not have any other upstream activities that could result in Scope 3 GHG emissions. Therefore, we estimate emissions from this source are zero (0).

Other (downstream)

Evaluation status

Not relevant, explanation provided

Explanation

PSEG decommissioned two coal units (Hudson and Mercer) in 2017; however, associated end of life emissions have been captured under Purchased goods and services, Capital goods and Waste (Categories 1, 2 and 5). This approach follows the

GHG Protocol's guidance for Scope 3 reporting and therefore, the emissions associated from this source are zero (0).

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

450

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

25,804,358,600

Metric denominator

Megawatt hour generated (MWh)

Metric denominator: Unit total

57,286,149

Scope 2 figure used

% change from previous year

10

Direction of change

Increased

Reason for change

Output increased.

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	12,961,977	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	652,663	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	32,909	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	24,150	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	3812	IPCC Fourth Assessment Report (AR4 - 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	30,748	633,904	24,150	692,614	This line item combines our electric generation business with the emissions associated with the electric distribution systems of our utilities and their natural gas distribution system. Note: Our utility is not vertically integrated and hence our electric generation business sells its power to the open market and our electric utilities then buy electricity

					discretely off the open market (our electricity does not flow directly to our electric utilities). Fourth column includes refrigerant fugitives.
Combustion (Electric utilities)	12,888,639	0	0	12,921,548	This breakdown includes only combustion emissions associated with grid supplied electric generation. Total includes N2O combustion emissions from electric generation.
Combustion (Gas utilities)	0	18,756	0	18,756	This breakdown includes only the combustion emissions associated with our utilities' gas distribution system.
Combustion (Other)	0	0	0	0	None
Emissions not elsewhere classified	42,590	0	0	42,590	This breakdown represents mobile emissions across the corporation.

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	13,675,512

C7.3

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

By business division

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
PSEG Power	12,960,889
PSE&G	714,623

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	13,675,512	None

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	965,720	0	0	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)
PSE&G	965,720	0

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?

Increased

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	0	0	No change
Other emissions reduction activities	93,174	Decrease	12.29%	Coal methane. Facility retirements. Methane. Replacement of cast iron pipelines with new state of the art materials (GSMP)
Divestment	0	No change	0	No change
Acquisitions	0	No change	0	No change
Mergers	0	No change	0	No change
Change in output	1,654,340	Increase	13.27%	Due to changes in output that occurred during 2018, despite other efforts to reduce emissions, emissions associated with our electric generation portfolio increased. (With the addition of two CCGTs totalling 1,300 MW of new generating units). The emissions increases are primarily related to these new high efficiency natural gas plants that came online.
Change in methodology	22,177	Increase	91.8%	Newly discovered inventory – SF6
Change in boundary	0	No change	0	No change
Change in physical operating conditions	8,562	Increase	18.11%	Due to changes in physical operating conditions that occurred during 2018, emissions were slightly higher than expected. The physical operating conditions relate to change in dispatch of our existing fossil plants and the delivery demands for electricity to our utility service territories as a result of weather and other external conditions.
Unidentified	0	0	0	No change
Other	0	0	0	No change

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?

Location-based

C8. Energy

C8.1

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

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	Yes
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	Yes
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)	Unable to confirm heating value			

Consumption of purchased or acquired electricity			54,765	
Consumption of purchased or acquired heat			56,004	
Consumption of purchased or acquired cooling			0	
Consumption of self-generated non-fuel renewable energy				
Total energy consumption				

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	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	Yes
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.

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	57,286,149	54,765	1,426,113	

Heat		56,004		
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)

1,187.2

Gross electricity generation (GWh)

Net electricity generation (GWh)

5,743.28

Absolute scope 1 emissions (metric tons CO2e)

5,471,425.6

Scope 1 emissions intensity (metric tons CO2e per GWh)

952.67

Comment

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

Oil

Nameplate capacity (MW)

593.6

Gross electricity generation (GWh)

Net electricity generation (GWh)

655.19

Absolute scope 1 emissions (metric tons CO2e)

490,297.1

Scope 1 emissions intensity (metric tons CO2e per GWh)

748.32

Comment

Gas

Nameplate capacity (MW)

5,817.28

Gross electricity generation (GWh)

Net electricity generation (GWh)

18,856.31

Absolute scope 1 emissions (metric tons CO2e)

6,940,456.6

Scope 1 emissions intensity (metric tons CO2e per GWh)

368.07

Comment

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

None

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

None

Nuclear

Nameplate capacity (MW)

3,680.3

Gross electricity generation (GWh)

Net electricity generation (GWh)

31,231.4

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

None

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

None

Hydroelectric

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

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

0

Solar

Nameplate capacity (MW)

538

Gross electricity generation (GWh)

Net electricity generation (GWh)

799.92

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

This number reflects installed capacity from PSEG Power only.

Other renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolut0e scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

None

Other non-renewable

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

Total

Nameplate capacity (MW)
11,872

Gross electricity generation (GWh)

Net electricity generation (GWh)
57,286

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

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)
41,899

Scope 2 emissions (basis)
Location-based

Scope 2 emissions (metric tons CO2e)
965,720

Annual energy losses (% of annual load)
5.3

Length of network (km)
36,159

Number of connections
2,300,000

Area covered (km2)
6,734

Comment
Connections 2.3 million electric and 1.8 million gas customers
This number includes line losses and facility electric and gas usage

C9. Additional metrics

C9.1

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

Description
Waste

Metric value
24,703

Metric numerator
Waste Disposed. Metric Tons

Metric denominator (intensity metric only)
none

% change from previous year

Direction of change

Increase

Please explain

Change – project work increased in the utility

Description

Energy usage

Metric value

56,100,859

Metric numerator

Kwh

Metric denominator (intensity metric only)

% change from previous year

7.6

Direction of change

Increased

Please explain

Facility energy consumption increased

Description

Energy usage

Metric value

1,719,657

Metric numerator

Therms

Metric denominator (intensity metric only)

% change from previous year

4.2

Direction of change

Increased

Please explain

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
	395 million		2019	Source: PSEG 2018 10K p.63 (Values expressed in millions). Power's projected expenditures for the various items listed above are primarily comprised of the following: • Baseline—investments to replace major parts and enhance operational performance. • Growth Opportunities—investments associated with new construction, including BH5, and with upgrades to increase efficiency and output at combined cycle plants. • Other—includes investments made in response to environmental, regulatory and legal mandates and other capital projects.

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
	Source PSEG 2018 10k p. 63. (Value in millions) PSE&G's projections for future capital expenditures include material additions and replacements to its T&D	2,580 Millions		2019

	systems to meet expected growth and to manage reliability. As project scope and cost estimates develop, PSE&G will modify its current projections to include these required investments. PSE&G's projected expenditures for the various items reported above are primarily comprised of the following: • Transmission—investments focused on reliability improvements and replacement of aging infrastructure. • Distribution—investments for new business, reliability improvements, modernization and replacement of equipment that has reached the end of its useful life. • Gas System Modernization Program—Gas Distribution investment program to replace aging infrastructure. • Solar/Energy Efficiency—investments associated with grid-connected solar, solar loan programs and customer energy efficiency programs.			

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

Investment end date

Investment area

Technology area

Investment maturity

Investment figure

Low-carbon investment percentage

Please explain

C10. Verification

C10.1

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

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No emissions data provided

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Biennial process

Status in the current reporting year

Underway but not complete for current reporting year – first year it has taken place

Type of verification or assurance

Limited assurance

Attach the statement

PSEG 2017 GHG Verification Statement FINAL 30May2018.pdf

Page/ section reference

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)
100

Scope
Scope 2 location-based

Verification or assurance cycle in place
Biennial process

Status in the current reporting year
Underway but not complete for current reporting year – first year it has taken place

Type of verification or assurance
Limited assurance

Attach the statement

PSEG 2017 GHG Verification Statement FINAL 30May2018.pdf

Page/ section reference

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

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?
No, we do not verify any other climate-related information reported in our CDP disclosure

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)?
Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
RGGI

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

RGGI

% of Scope 1 emissions covered by the ETS

21

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

0

Allowances purchased

Verified emissions in metric tons CO2e

Details of ownership

Facilities we own and operate

Comment

Includes resources located in CT, NY and MD. NJ assets will be subject to RGGI beginning on 1/1/2020

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

PSEG supports and advocates for a more meaningful reflection of the cost of carbon emissions. For our own emitting facilities, we operate in compliance with regulations where they exist and apply to our facilities. Our strategy is first to cost-effectively minimize emissions through investments in operational efficiency and clean energy and then to procure and surrender emissions allowances as required under the programs. In addition, PSEG is committed to working to advance carbon reductions to net zero in 2050 while preserving safety, reliability, improving resiliency and return on investment for our shareholders with reasonable costs to customers. As a merchant generator, PSEG Power will continue to produce low-cost electricity by efficiently operating our nuclear, natural gas and renewable energy facilities.

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
Drive low-carbon investment
Stress-test investments
Identify and seize low-carbon opportunities

GHG Scope

Scope 1
Scope 2

Application

Business units: Power

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

Variance of price(s) used

Proprietary information

Type of internal carbon price

Internal fee

Impact & implication

PSEG uses a cost on carbon in its market fundamentals analysis to guide our investments in new and existing electric generation projects and help to guide the implementation of our strategic plan. PSEG typically models several wholesale power price scenarios based on a combination of factors including fossil fuel prices, economic growth, and the effects of state and federal policies. To inform management of the long-term potential impacts and opportunities of carbon policy, PSEG continually conducts near- and long-term modeling to best determine and inform our daily market positions, near-term portfolio management, and investment and development decisions. We identify and regularly review key market drivers, including potential regulatory or policy influences such as a

price on carbon, and use them in our ongoing analysis to capture a range of plausible future outcomes and develop our overall strategy. Regulation of carbon is one of many considerations in our planning models, and results are weighed with other issues that may affect market conditions.

C12. Engagement

C12.1

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

Yes, our customers

Yes, other partners in the value chain

C12.1b

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

C12.1c

(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.

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 policymakers

Trade associations

Funding research organizations

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
Cap and trade	Support with minor exceptions	PSEG's engagement occurs through various forms of communication with regulators, policymakers and stakeholders. These discussions generally occur at the federal level	PSEG has long supported a federal price on carbon, whether through a cap and trade system, carbon tax or other approach.

		given the global scope of the underlying issue. In addition, PSEG has worked collaboratively with other power utilities and environmental groups to support the RGGI program. We continue to advocate for a national solution, including through membership in the CEO Climate Dialogue, a cross-sectoral organization that seeks to leverage CEO voices to build support for a national price on carbon and whose guiding principles for federal action include economy-wide GHG emission reductions of 80% or more by 2050.	
Carbon tax	Support	PSEG's engagement occurs through various forms of communication with regulators, policymakers and stakeholders. These discussions generally occur at the federal, state and PJM levels given the global scope of the underlying issue. In addition, PSEG has worked collaboratively with other power utilities and environmental groups to support the RGGI program. At the national level, PSEG is a member of the CEO Climate Dialogue, a cross-sectoral organization championing a federal price on carbon.	PSEG has long supported a federal price on carbon whether through a cap and trade system, carbon tax or other approach. Also, PSEG belongs to the CEO Climate Dialogue, a cross-sectoral organization that seeks to leverage CEO voices to build support for a national price on carbon and whose guiding principles for federal action include economy-wide GHG emission reductions of 80% or more by 2050.
Energy efficiency	Support	PSEG supports federal and state policy initiatives to improve the energy efficiency of the U.S. economy. PSEG supports reasonable and justified policies that do not adversely affect any individual customers or businesses, including PSEG. Engagement occurs through various forms of communication with regulators, policymakers and stakeholders. This engagement occurs both at the federal level as well as the state level on energy efficiency legislation and potential regulations. Engagement is focused especially on those state officials and	Consistent with New Jersey's recently enacted energy efficiency legislation, PSE&G has outlined a clean energy proposal to invest $3.5 billion over six years in energy efficiency and other programs that will reduce energy bills and combat climate change, which we refer to as our Clean Energy Future program. The program, which PSE&G filed with the BPU later this year, includes: $2.5 billion for energy efficiency to reduce customer bills and lower energy use, which will decrease air pollution, including emissions

		regulators involved in setting the required amounts of energy efficiency to be achieved by our customers. PSEG supports policies that promote sustainable communities through its investment in organizations such as Sustainable Jersey and the PSEG Institute of Sustainability Studies at Montclair State University.	that accelerate climate change; $300 million for building a “smart” electric vehicle infrastructure; and $100 million for utility-scale energy storage systems that will enable greater development of renewable resources and enhance resiliency. Finally Energy Cloud (EC) program which will include installing approximately two million electric smart meters and associated infrastructure.
Clean energy generation	Support	PSEG supports the use of clean energy generation including nuclear, high efficiency natural gas combined cycle, and renewables including energy storage. The agreement to sell PSEG Power’s interest in the Keystone and Conemaugh units is the latest step in PSEG Power's long-term strategy, which includes eliminating non-core assets and moving away from coal-fired generation. In October 2016, PSEG Power announced the retirements of its Hudson and Mercer coal-fired generating stations comprising 1,252 MW. PSEG Power has also announced the early retirement of its 383 MW coal unit in Bridgeport, Connecticut, in 2021. Over the past few years and leading up to 2021, PSEG will have retired or exited through sales over 2,400 MW of coal-fired generation. PSEG ranks third among privately/investor-owned power producers in the U.S. with the lowest carbon emissions rates (2017), according to the new report "Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States," released by M.J. Bradley & Associates, Bank of America, CERES, Entergy, Exelon and NRDC.	Over the last few years, low natural gas prices have impacted fuel diversity options for central station power generators forcing tough choices for operators of existing nuclear facilities. During 2017 and into 2018 PSEG engaged in a broad stakeholder outreach process. The process was designed to promote the positive attributes of nuclear energy and the importance of maintaining this generation source to ensure achievement of the state’s future clean energy goals. Our efforts led to the enactment of legislation that will provide economic support for the continued operation of Salem and Hope Creek nuclear as part of New Jersey’s energy mix. This combined with separate clean energy legislation will serve as the foundation for New Jersey’s energy strategy moving into the next several decades. NJBPU awarded ZECs to Salem and Hope Creek in April 2019.

Adaptation or resilience	Support	PSEG is a founding member of the New Jersey Climate Change Alliance and through this organization has promoted the research, reporting and development of policies that promote adaptation across various business interests, geographic regions and community demographics (in particular low income and environmental justice communities).	In May 2018, the Governor of New Jersey signed legislation, referred to as the Zero Emission Certificate (ZEC) legislation that recognizes that nuclear power is a critical component of New Jersey's clean energy portfolio and an important element of a diverse energy generation portfolio that currently meets approximately 40 percent of New Jersey's electric power needs. The ZEC legislation created a program administered by the New Jersey Board of Public Utilities (BPU). The BPU established processes to provide for the purchase of ZECs from selected nuclear plants and recovery of those ZEC payments through a non-bypassable distribution charge. In April 2019, PSEG Power's Salem 1, Salem 2 and Hope Creek nuclear plants were awarded ZECs. These nuclear plants are expected to receive ZEC revenue for approximately three years, through May 2022.
Climate finance	Support	PSEG supports policies that will decouple rates from energy usage and improve the ability for utilities to invest in energy efficiency, renewables and electric vehicle infrastructure. It also supports the use of funds generated via market mechanisms such as RGGI to spur investment in these areas and incentivize expansion of clean energy infrastructure deployment, and research to develop new technologies.	Consistent with New Jersey's recently enacted energy efficiency legislation, PSE&G has outlined a clean energy proposal to invest $3.5 billion over six years in energy efficiency and other programs that will reduce energy bills and combat climate change, which we refer to as our Clean Energy Future programs. This filing includes a proposal for a "Green Enabling Mechanism" (GEM). this mechanism would ensure that PSE&G's business and regulatory framework aligns well with policies that encourage investment in wide-scale energy efficiency

			programs and other clean energy solutions
Regulation of methane emissions	Support	PSEG has worked to cost-effectively prevent methane emissions through a combination of proactive system improvements thru our Gas System Modernization program and other efforts and our voluntary participation in EPA's Natural Gas STAR program. Additionally, we participate in several methane reduction stakeholder groups, including EPA's Natural Gas STAR Methane Challenge Program and we work on an ongoing basis with some environmental organizations to understand methane emissions from the natural gas delivery system and ways to reduce methane leak rates.	None – replacement of cast iron mains through state regulatory filings

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

Electric Edison Institute (EEI)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

As Congress works to address this issue, it is essential to include effective consumer protection measures that help to reduce price increases for consumers and avoid harm to U.S. industry and the economy.

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

PSEG actively participates as a member of several committees and also holds leadership positions within EEI. PSEG has been consistently one of the more aggressive members of the trade association in our support of national climate legislation. Ralph Izzo is on the Executive Committee and is a regular participant in CEO dialogues on climate change and chairs two CEO working groups. PSEG participates as a founding member of the ESG/Sustainability Steering Committee

Trade association

American Gas Association (AGA)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

AGA works with members and leading experts to evaluate how new federal environmental regulatory proposals could influence natural gas local distribution systems and customers. We advocate for government rules and policies that protect the environment while allowing our natural gas utility members to continue to deliver clean, affordable natural gas to customers, safely and reliably.

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

PSEG actively participates as member of several committees and leadership positions within AGA. PSE&G President Dave Daly sits on the AGA Executive Committee.

Trade association

Nuclear Energy Institute (NEI)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

From website: "Reducing carbon dioxide emissions, while fostering sustainable development is a major global challenge of the 21st century. Nuclear energy is a vital source of electricity that can meet the nation's growing energy needs with a secure, domestic energy" supply that also protects our air quality.

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

Ralph Izzo is the current chair of NEI. PSEG actively participates as member of several committees and holds a number of leadership positions within NEI.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3e

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

PSEG is a founding member of the New Jersey Climate Change Alliance, which was formed in 2011 by a diverse group of stakeholders. The Alliance will focus on climate change preparedness in key impacted sectors (public health; watersheds, rivers and coastal communities; built infrastructure; agriculture; and natural resources) through: conducting outreach and education of the general public and targeted sectoral leaders, developing recommendations for state and local actions through collaboration with policymakers at the state, federal and local levels, undertaking demonstration and pilot projects in partnership with the private sector, local governments, non-governmental organizations, and others, identifying science, research and data needs; and developing capacity for implementation of preparedness measures and documentation of best practices.

PSEG has been part of Sustainable Jersey's development and success since its formation in 2011 and has provided funding for the small grants municipal and schools program. Sustainable Jersey's mission aligns with ours in its commitment to sustainability, especially by fostering a new generation of informed citizens and promoting a healthier environment in communities across New Jersey including the implementation of clean energy systems. Sustainable Jersey has established a supportive framework for communities and schools working toward sustainability. PSEG's underwriting of the Small Grants Program has enhanced Sustainable Jersey's ability to support core program functions, manage the certification program and provide technical assistance to communities. The Small Grants Program helps participants implement sustainability initiatives that improve the quality of life for their residents and communities.

The PSEG Institute of Sustainability Studies at Montclair State University provides program support for sustainable communities and businesses. PSEG funding is matched with other funding sources to provide internship opportunities to students from MSU and other New Jersey universities to serve on the Green Teams and complete sustainability focused projects. As a transdisciplinary field comprising STEM disciplines (e.g., mathematics, geology, geography, engineering, statistics, chemistry, biochemistry, biology, and computer science) and integrated across business and behavioral and social sciences, sustainability engages students to benefit corporations and communities alike.

Princeton E-ffiliates Partnership: PSEG is a general member of the Princeton E-ffiliates Partnership which is housed in Princeton's Andlinger Center for Energy and the Environment. The Andlinger Center is a "multidisciplinary research and education center, whose singular mission is to develop technologies and solutions to better our energy and the environmental future".

PSEG is a member of the Business Environmental Leadership Council of the Center for Climate and Energy Solutions. PSEG is supporting the C2ES effort to model sector-specific pathways to 2050 de-carbonization. PSEG is member of Third Way, a national progressive think tank driving federal policies to value zero emitting technologies including existing nuclear and policies that would foster development of advanced nuclear.

PSEG is a member of a coalition of companies working to advance federal climate change policy. The organization also afforded an opportunity this year to participate in a net-zero Workshop hosted by CERES with other like-minded companies. Ralph Izzo has joined the CEO

Climate Dialogue, a cross-sectoral organization that seeks to leverage CEO voices to build support for a national price on carbon. Additionally, our CEO Ralph Izzo has also presented PSEG's Long-Term Strategy as part of the CECP (Chief Executive for Corporate Purpose.)

Finally, PSEG's state government affairs and federal affairs departments work closely with the lines of business to understand industry trends and ongoing climate change analysis that may influence our public position or engagement efforts. Advocacy strategies are developed and implemented to align with business priorities.

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?

As a company whose operations can be significantly impacted by public policies, it is essential that PSEG take an active role in the political process and the debate that ultimately shapes public policy. PSEG regularly communicates with government officials on issues affecting our business, participates in trade associations that focus on policies that may influence our company and participates in the political process in a way that aligns with the long-term interests of PSEG and our stockholders, our employees and the communities we serve.

For more than a century, PSEG's mission was to provide universal access to an around-the-clock supply of reliable, affordable power. As our larger community goals have changed, energy companies have evolved alongside them. Today, the role of the utility is evolving as we adjust to meet the changing needs and demands of our customers.

At PSEG, our vision of the future is one where customers use less energy, the energy they use is cleaner, and its delivery is more reliable and more resilient than ever. The challenge is to realize this future without abandoning our longstanding commitment to an affordable and universal power supply.

Memberships in all directly funded or supported organizations are regularly reviewed by the Corporate Contributions and Corporate Citizenship organization within PSEG to ensure consistency. Additionally, executives and/or subject matter experts hold either board level or advisory positions within many of these organizations to further ensure consistency with PSEG's overall strategy.

PSEG's climate strategy is built around three primary structural areas; promoting energy efficiency, maintaining diverse clean central station power generation and deployment of renewable energy sources. Success of the overall strategy depends on the ongoing vitality of all three areas. In addition, as a responsible corporate citizen, we have sought cost-effective solutions to meet New Jersey's climate mitigation goals.

In 2018, PSEG established a new business function devoted to Corporate Citizenship – a change that recognizes the relevance of citizenship to the strategic business objectives of our company. The purpose of this new unit, which also includes our Sustainability function, is to reinforce the ideal of our founder, Thomas McCarter – "to serve the state of New Jersey and to make it a better place in which to work and live" – and, at the same time, to implement our progressive regulatory agenda, to respect and enhance the priorities of the diverse communities we serve, and to fulfil our stakeholders' expectations.

In January 2018, the Governor of New Jersey signed Executive Order No. 8 directing the BPU to begin the process of moving the state toward its 2030 goal of 3,500 MW of offshore wind energy generation. An initial solicitation was established for 1,100 MW of offshore wind, with bids due in December 2018. NJ regulators awarded the entire 1,100 MW to Orsted in June 2019; PSEG is also considering making a direct equity investment in this Ocean Wind project.

Over the last few years, low natural gas prices have impacted fuel diversity options for central station power generators forcing tough choices for operators of existing nuclear facilities. During 2017 and into 2018 PSEG engaged in a broad stakeholder outreach process. The process was designed to promote the positive attributes of nuclear energy and the importance of maintaining this generation source to ensure achievement of the State's future clean energy goals. Our efforts led to the enactment of legislation that will provide economic support for the continued operation of Salem and Hope Creek nuclear as part of New Jersey's energy mix. This combined with separate clean energy legislation will serve as the foundation for New Jersey's energy strategy moving into the next several decades.

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 voluntary sustainability report

Status

Complete

Attach the document

PSEG_Sustainability_Report_2018 (1).pdf

Page/Section reference

Page 25: "Responding to the challenges of Climate Change"

Content elements

Strategy
Emissions figures

Emission targets

Comment

2019 Sustainability Report will be available December 2019

Publication

In voluntary communications

Status

Underway – this is our first year

Attach the document

New climate short paper should be referenced here. Add the link and attached

Page/Section reference

New climate short paper should be referenced here. Add the link and attached

Content elements

Governance
Strategy
Emission targets

Comment

PSEG has committed to creating its first comprehensive climate report following the TCFD framework in 2020.

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	ESG & Sustainability Manager	Environment/Sustainability manager