

Welcome to your CDP Climate Change Questionnaire 2021

C0. Introduction

C0.1

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

Essential Utilities, Inc. (referred to as “Essential Utilities”, the “Company”, “we”, “us”, or “our”), a Pennsylvania corporation, is the holding company for regulated utilities providing water, wastewater, or natural gas services to an estimated five million people in Pennsylvania, Ohio, Texas, Illinois, North Carolina, New Jersey, Indiana, Virginia, West Virginia, and Kentucky under the Aqua and Peoples brands. One of our largest operating subsidiaries, Aqua Pennsylvania, Inc. (“Aqua Pennsylvania”), accounted for approximately 55% of operating revenues and approximately 67% of income for our Regulated Water segment in 2020. As of December 31, 2020, Aqua Pennsylvania provided water or wastewater services to approximately one-half of the total number of water and wastewater customers we serve. Aqua Pennsylvania’s service territory is located in the suburban areas in counties north and west of the City of Philadelphia and in 27 other counties in Pennsylvania. Our other regulated water utility subsidiaries provide similar services in Ohio, Texas, Illinois, North Carolina, New Jersey, Indiana, and Virginia. Additionally, pursuant to the Company’s growth strategy, commencing on March 16, 2020 with the completion of the Peoples Gas Acquisition, the Company began to provide natural gas distribution services to customers in western Pennsylvania, Kentucky, and West Virginia. Approximately 93% of the total number of natural gas utility customers we serve are in western Pennsylvania. Lastly, the Company’s market-based activities are conducted through Aqua Infrastructure, LLC and Aqua Resources Inc., and certain other non-regulated subsidiaries of Peoples. Prior to our October 30, 2020 sale of our investment in a joint venture, Aqua Infrastructure provided non-utility raw water supply services for firms in the natural gas drilling industry. Following the October 30, 2020 closing, Aqua Infrastructure does not provide any services to the natural gas drilling industry. Aqua Resources offers, through a third-party, water and sewer line protection solutions and repair services to households. Prior to last year, our CDP submissions were filed under our previous name, Aqua America, Inc.

This CDP submission presents information for the year of 2020 and is Essential’s first submittal to include our recently acquired natural gas utility operations. Although the Peoples Gas Acquisition was effective on March 16, 2020, the information and data in this report include

activity from before this time, starting January 1st, to ensure consistency with the presentation of water and wastewater operations.

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	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1, 2020	December 31, 2020	Yes	1 year

C0.3

(C0.3) Select the countries/areas 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 chosen approach for consolidating your GHG inventory.

Financial control

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-level committee	<p>The board of directors is briefed on ESG matters in its regularly scheduled meetings, through various channels and reporting paths. The corporate governance committee takes primary responsibility for providing board oversight for the company's ESG profile, strategy, and activities. At least five times per year, both the chief of staff, who reports to the CEO and oversees the ESG program, and the ESG Manager present an update to the corporate governance committee of the board on ESG matters. Often joining them are various leaders from across the organization to speak to various subjects. Written reports are provided to the full board at each meeting and, for certain ESG matters, presentations are made to the full board. Climate-related matters are an area of particular attention throughout the year, and there is even one meeting solely dedicated to a deep dive on climate change and environmental sustainability. During this detailed review, there is analysis and discussion of climate change initiatives, strategies, peer and industry benchmarking, and progress towards related goals. These matters are discussed both in terms of impact to current operations as well as through the lens of future acquisition and expansion opportunities and resiliency.</p> <p>Additionally, climate-related items are covered under the enterprise risk management (ERM) review conducted by the Risk Mitigation and Investment Policy Committee of the board and is reported to the full board at each of its regularly scheduled meetings. Also, there is additional oversight provided by the Audit Committee, which is informed about climate change risks through the Compliance and Disclosure Committees, comprised of the company's management.</p> <p>Our board members understand the significance of climate change and passionately believe it is their duty to provide active oversight on these matters and be well-educated on the subject.</p>
Chief Executive Officer (CEO)	<p>Our Chief Executive Officer, who also serves as the board's Chair, is responsible for Essential's overall direction and strategy related to climate issues for operations and aligning corporate growth with consideration of climate-related issues. Further, the CEO is the most direct interface with current and future investors in addressing our company's alignment with ESG and climate goals. As such, the CEO provides a valuable voice and perspective to board discussions on climate change matters and serves as a crucial bridge between the board and the company's management to ensure alignment on climate-related matters. Essential's CEO actively engages in many meetings and discussions throughout the year on climate-related matters, both internally and with the larger utilities industry.</p>

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
<p>Other, please specify</p> <p>Five times per year</p>	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Reviewing and guiding annual budgets</p> <p>Reviewing and guiding business plans</p> <p>Setting performance objectives</p> <p>Monitoring implementation and performance of objectives</p> <p>Overseeing major capital expenditures, acquisitions and divestitures</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<p>Reviewing and guiding strategy- The board views the strategic direction of Essential within the proper context of climate risks and opportunities. It is not a separate, siloed analysis but rather climate-related matters are integrated organically into larger strategic discussions. As a utility that operates critical infrastructure, resiliency and sustainability are core to our business and the board helps to ensure climate change and the transition to a low-carbon economy are accounted for within enterprise strategic planning.</p> <p>Reviewing and guiding major plans of action- The board is and wishes to be actively involved in reviewing and guiding major plans of action and initiatives regarding reducing greenhouse gas emissions and promoting climate resiliency.</p> <p>Reviewing and guiding risk management policies- As stated in section C1.1A, there are multiple formal channels by which the board provides clear oversight on enterprise risk management policies, which include climate-related matters.</p> <p>Monitoring implementation and performance of objectives- Management transparently reports on both successes and challenges of its climate-related projects and efforts. The board must assess this performance to ensure that these critical objectives are met.</p> <p>Overseeing major capital expenditures, acquisitions, and divestitures- The board provides strong governance on such matters, which include major programs like our replacement of methane leak-prone pipe and various other emissions-reducing initiatives.</p> <p>Monitoring and overseeing progress against goals</p>

		<p>and targets for addressing climate-related issues- A dashboard showing progress against climate-related goals and targets is presented to the board and discussed at each meeting, five times per year.</p> <p>Reviewing and guiding annual budgets- Our emissions reduction initiatives, such as our gas pipeline replacement and REC purchasing, are major budgetary line items and require detailed consideration from leadership at both board and management levels, which must prudently manage Essential's finances while meeting climate goals.</p> <p>Reviewing and guiding business plans- The board reviews Essential's business plans and strategy in light of climate-related matters and provides its perspective and guidance to management as key initiatives and actions are discussed.</p> <p>Setting performance objectives- Climate-related metrics are a part of the Essential Short-Term Incentive Awards Program and the board is well aware of the importance of tying company performance and management's pay to climate-related targets and goals.</p>
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C1.2

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

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify Chief Environmental Officer	Both assessing and managing climate-related risks and opportunities	Annually
Energy manager	Both assessing and managing climate-related risks and opportunities	As important matters arise
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	Quarterly

Other, please specify Vice President, Chief Of Staff, Investor Relations and Communications	Both assessing and managing climate-related risks and opportunities	Quarterly
Other, please specify Executive Vice President, General Counsel and Secretary	Both assessing and managing climate-related risks and opportunities	Quarterly
Chief Financial Officer (CFO)	Both assessing and managing climate-related risks and opportunities	As important matters arise
Chief Operating Officer (COO)	Both assessing and managing climate-related risks and opportunities	As important matters arise
Other, please specify Vice President, Fleet Operations	Both assessing and managing climate-related risks and opportunities	As important matters arise

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).

As set forth in responses to section C1.1, the company has various reporting pathways, touch points, and methods to actively manage climate-related issues. For example, climate-related issues through the Enterprise Risk Management (ERM) framework are reviewed by the General Counsel to determine risks related to both short term acute events and risk due to longer term climate change issues for both physical assets and production operations. At least five times per year, an update on the progress being made with ERM is presented to the full Board of Directors. Our Chief Executive Officer is responsible for the overall direction and strategy related to climate issues for operations and aligning corporate growth with consideration of climate-related issues. Further, the CEO is the most direct interface with current and future investors in addressing our company's alignment with ESG and climate goals.

Our Chief Financial Officer is responsible for monitoring the financial impact of climate-related events and projecting the financial risk of future events for current operations. The CFO assesses the financial impact of climate-related issues in both growth and expansion opportunities. Our Chief Operating Officer is responsible for ensuring physical assets are protected from climate related issues and implementing operational procedures and efficiencies to reduce energy consumption. The Chief Environmental Officer reports to the Chief Operating Officer and downward to each state president and corporate engineering functions to provide the overarching guidance and oversight in managing and evaluating risk through our Key Performance Indicators (KPIs) which include energy intensity. It is the Chief Environmental Officer's responsibility to prepare and present an annual report on environmental sustainability

matters to the Board of Directors. The Corporate Energy manager, who reports through the Vice President Corporate Engineering to the Senior Vice President, Chief Operating Officer, leads the assessment and tracking of energy intensity for production assets. This individual assists each state's president and chief engineer with identifying and implementing energy reduction measures at well stations, water treatment plants and wastewater treatment plants. The Corporate Energy Manager is also responsible for energy purchases, including procurement of green energy within those states with deregulated markets and the assessment and implementation of on-site renewable energy projects where feasible. The Vice President of Fleet Operations, reporting up through the Chief Administrative Officer to the Chief Executive Officer, is responsible for managing the large fleet of vehicles across the enterprise and implementing efficiency initiatives that reduce emissions and climate impact.

The Chief of Staff oversees the company's ESG program in concert with responsibilities pertaining to public and investor relations. In this capacity, the Chief of Staff coordinates with the aforementioned individuals and others within the organization on various initiatives and also manages both internal and external communications on these matters. In May 2020, Essential Utilities created an ESG Manager position. This is a full-time role that reports to the Chief of Staff and is completely dedicated to further developing and maturing the ESG profile of the Company, of which climate change matters and impacts are among the most critical.

Additional management oversight of climate-related matters is provided by the ESG oversight committee, which was formalized in 2020. Members of this group include over a dozen senior leaders from across the organization, each lending a unique and valued perspective. This group meets at least once per quarter to discuss recent progress with ESG initiatives, industry news and trends, strategic short and long-term planning, approval of various initiatives and policies and to recommend matters to be presented to the CEO and the board. We remain dedicated to continually strengthening our governance on climate-related matters in recognition of its critical importance to our society, planet, and company.

C1.3

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

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Environmental stewardship is one of the several pillars of the Essential Short-Term Incentive (STI) Plan, outlined in detail in our proxy filing. The quantity of gas leaks from our distribution network has a 2.5% weighting. We also measure ourselves against the miles of methane leak-prone pipe we planned to replace at the start of the year and this, too, has a 2.5% weighting. In 2020, we experienced 150% and 120.2% achievement of these goals, respectively. These elements of our STI Plan promote minimization of our largest source

		<p>of Scope 1 and 2 emissions, fugitive methane leaks from our gas distribution network.</p> <p>Another such incentivized factor, relevant to certain managers in our organization, is energy intensity, a crucial metric for our operations. This promotion of energy efficiency has contributed to significant reductions, in recent years, of energy usage at our wastewater plants, for example.</p>
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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).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Management group	Monetary reward	Energy reduction project	Incentives are realized through achieving/exceeding Key Performance Indicators (KPIs) based on internal benchmarks for each state and meeting external industry metrics, which include cost of operations and energy consumption, management, and engineering. Annually, these benchmarks are evaluated and adjusted to meet new goals. Incentive levels vary by position and state. There is an energy intensity KPI for certain managers in our organization and this drives awareness of the acute climate threat and its potential impact on operational costs. This KPI encourages management to proactively implement measures to address and reduce energy intensity in an effort to lower costs and reduce carbon emissions.
Management group	Monetary reward	Emissions reduction project	Quantity of gas leaks is a climate-related metric is included as a component of Essential's Short-Term Incentive Awards (STI), in order to promote accountability for performance in this area. In 2020, we recorded 621 gas leaks, which is well below our targeted achievement of 860. More information on Essential's STI program can be found in our proxy filing, available on our website.
Management group	Monetary reward	Emissions reduction project	Quantity of gas distribution pipe miles replaced versus planned replacements is a climate-related metric that is included as a component of Essential's Short-Term Incentive Awards (STI), in order to promote accountability for performance in this area. In 2020, we replaced slightly more miles of leak-prone distribution pipe than we had

			planned (104.04% of total). More information on Essential's STI program can be found in our proxy filing, available on our website.
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C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	5	We have determined that, within our areas of operations, the short-term time horizon of 0-5 years is an actionable and pertinent range, as both physical and transitional risks are likely to adjust and shift in the short-term. Evaluating our exposure to risks in the short-term allows us to develop more effective strategies to reach our sustainability goals and transition to a low-carbon economy.
Medium-term	6	15	<p>The company is a long-term holder of water, wastewater, and gas distribution network assets. Through our scenario analysis methodology, we have determined that water and wastewater assets, along with their associated risks and opportunities, must be addressed in the medium-term (6-15 years). As such, the company engages in annual five-year planning cycles and, on occasion, ten-year planning cycles to address capital improvement to infrastructure and operations. The planning in each case involves budgeting capital, environmental needs, maintenance, and operations. Deficiencies noted during repeated acute events can be addressed through capital infrastructure improvement projects and costs can be allocated for within future rate cases.</p> <p>Similarly, our scenario analysis has shown that the medium-term time horizon is important for our gas operations as well, as we examine how emissions-reducing technologies and alternative fuels may be implemented in the industry and various regulatory responses to climate change may take further shape. Our infrastructure improvement program, which includes the replacement of leak-prone pipe, is also scheduled to conclude within this timeframe.</p>

			Climate-related issues recognized in the medium-term can be addressed by the existing planning process for improvement projects and managed effectively within the context of resilient operations. This time horizon is congruent with the company's climate goals.
Long-term	16	30	<p>Long-term or emerging risks include economic, social, environmental, regulatory, and political change, as well as new technologies. Engaging in long-term (16-30 year) planning cycles where enterprise-wide issues are evaluated are important in addressing actions today where their outcomes pay dividends far into the future. An example of a long-term business activity is the replacement of water and wastewater pipe to ensure long-term product delivery.</p> <p>As identified through our scenario analysis methodology, we have determined that many climate-related issues are most impactful to our areas of operations in the long-term, and company-wide strategies include contingencies for various climate-related scenarios.</p>

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Essential Utilities defines climate-related impacts through a model which weights likelihood, cost, magnitude of impact and time horizon. Evaluating exposure to climate-related risks and opportunities over a range of time horizons allows for a strategy for the transition to a low-carbon economy recognized in the Paris Agreement and UN SDGs. In conjunction with the Villanova University Sustainable Engineering program, the goal was to define a model focused on processes for identifying, assessing, and managing climate-related issues as well as on the climate-related risks and opportunities identified by the company. This information offers investors greater confidence that the company understands and has properly assessed the potential impacts to climate related issues.

This model was developed in conjunction with Villanova University and formalizes the process, adding consistency in approach and providing a method that is easily repeatable and evergreen. The model was also defined using the CDP framework as a reference to allow for consistency in evaluation and reporting and to maintain consistency with CDP as it evolves over time. The scoring methodology developed applies to both risks and opportunities. This is the first year this model has been applied and uses a broad annualized cost impact as related to climate risk from temperature rise and precipitation change across several of the company's geographic areas. Financial impacts in terms of the analysis are defined at three levels (Low \$0 to 250K, Medium \$250K to 1M, and High >\$1M) and they can be from a single

event/occurrence or an annualized cost impact of a specified time horizon (for negative impact, we included labor, control infrastructure and operations and maintenance (O&M) risk; for opportunities, we included cost savings or additional revenue). While cost is a quantitative assessment of impact, it was also important to assess the qualitative factors within the Magnitude of Impact (MOI).

This scenario analysis process is conducted with Villanova University as a rigorous workshop across several weeks, with internal meetings as well to prepare for each workshop session and to discuss various opinions and ideas. Multiple members of management with climate-related responsibilities, as outlined in section C1, partake in this process and the findings and conclusions are shared and discussed with company leadership. This analysis had previously been performed for our legacy water and wastewater operations but was separately adapted for our newly acquired gas operations as well. The result is a consistent and similarly rigorous scenario analysis based on climate science, conducted for each segment of our company, and with the facilitative guidance of an experienced and objective third-party. We believe this to be a best practice for companies completing the CDP and we look forward to continually revisiting and updating our analysis in future years.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

Time horizon(s) covered

Short-term

Medium-term

Long-term

Description of process

Risks and opportunities within the model are defined using a STEEP (Sociological, Technological, Economical, Environmental, and Political) analysis method to evaluate both internal and external forces on their likelihood of occurrence and then on the magnitude of their impact, time horizon and likelihood. Topic areas were selected and, for implications within those areas specific risks or opportunities (R&O) were addressed. The implications are given a score based on likelihood, cost and magnitude of impact (MOI) on operations as they relate to climate impacts under the Businesses as Usual and Temperature Rise Below 2 Degrees Celsius climate-related scenarios. This method

allows for a semi-quantitative method for ranking of risks and opportunities and serves to triage a larger number of implications. The process also allows for implications to be updated and easily re-evaluated on an annual basis. This re-evaluation takes into consideration updates to climate models and the addition of new topics and implications as the businesses and business locations change. Our analysis was designed based on guidance from the Task Force on Climate Related Financial Disclosures (TCFD) surrounding scenario analysis, which is a key recommendation from the organization.

Review of the STEEP analysis was used to guide the selection of Risks and Opportunities (R&Os) reported below. Multiple members of management with climate-related responsibilities, as outlined in section C1, partake in this process and the findings and conclusions are shared and discussed with company leadership. The analysis results and individual section scores for each implication were considered in the selection of the most relevant and material R&Os to include in this CDP submittal.

Please refer to C3.2a for additional detail on our analysis process.

Water and Wastewater:

The analysis has six topic areas: Capital Investments vs. Extreme Temperatures, Higher Energy Costs vs. Temperature, Market Growth vs. Groundwater Availability, Infrastructure Resilience vs. Frequency and Intensity of Storm Events, System Compliance vs. Regulations on Contaminants of Emerging Concern (CECs), and Population Dynamics vs. Source Water Availability. The six topic areas we identified yielded 37 implications of a risk or opportunity (R&O) across three geographic areas encompassing our operations. The STEEP analysis method helped provide the scoring rational and justification in selecting specific R&Os over others. Based on previous qualitative methods, implications such as flooding figured more prominently. However, when analyzed within the STEEP process, other implications scored higher. The implications with the highest scores are presented in the subsections below.

To address the sections of implications and scoring, we utilized WRI's Aqueduct Water Risk Atlas, Global Flood Analyzer and GEMI's Local Water Tool and analysis of existing infrastructure within 100-year and 500-year flood plains. Quantitative scenario analyses from the CMIP5 climate data set for the period 1950-2099 under the RCP2.6 and RCP8.5 scenarios within the BCCAv2 ccs4 model run were used to gauge time-frame and MOI. Also, we considered past recent history with hurricanes in North Carolina and Texas in relation to actual operational and financial impacts.

Gas:

The analysis has four topic areas: Heating Degree Days vs. Cost of Carbon, Extreme Cold vs. Hydrogen Blending, Population Change vs. National Ban on Fracking, and Severe Weather Events vs. Decarbonization Incentive (Streamlining vs. Regulation). The four topic areas we identified yielded 17 implications of a risk or opportunity across our primary geographic area of the greater Pittsburgh metropolitan region. The STEEP analysis method helped provide the scoring rational and justification in selecting specific

R&Os over others. The implications with the highest scores are presented in the subsections below.

Quantitative scenario analyses from the CMIP5 climate data set for the period 1950-2099 under the RCP2.6 and RCP8.5 scenarios within the BCCAv2 ccs4 model run were used to gauge time-frame and MOI.

C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	The company is a publicly traded utility that is regulated by State and Federal Government agencies (e.g. Environmental Protection Agency, Securities Exchange Commission, and the Public Utility Commissions) in each state in which it operates. Therefore, current climate-based regulations are considered relevant and always considered in temporal risk planning.
Emerging regulation	Relevant, sometimes included	Emerging regulations are considered in risk planning and need to be addressed as they arise (e.g. PFAS, lead, cyanotoxins, carbon pricing, bans on fracking) for water, wastewater, and gas activities. These emerging water quality, contaminants of emerging concern, and greenhouse emissions regulations may impact rates, require alternative water sources or increase treatment costs and can be financially significant. These are important because they may increase the energy required to process water and wastewater. Further, specific climate-related regulation in the future can impact our business as well. Examples may include tariffs and/or fees from acute weather events or new mandates on renewable energy. As such, designing and managing a strong environmental program that anticipates future trends and issues is an important way to mitigate such risk.
Technology	Relevant, sometimes included	Transitional risks such as technology are considered when assessing the potential to substitute existing equipment or processes with lower emission options. There is also the risk of utilizing a new technology in our operations that does not prove to be a worthy investment. There is an obvious need for digital technologies within the water, wastewater, and gas sectors, in particular technologies that can improve infrastructure performance (process and pump automation) and the effectiveness of repairs to infrastructure and capital investments. In a capital-intensive business such as ours, making correct choices on efficient technology represents a major part of our climate risk

		mitigation strategy, especially given the longer-term period of service of much of this equipment.
Legal	Relevant, always included	Climate change litigation against companies, governments and individuals is on the rise, and these risks are considered relevant due to their potential economic impact to the company. Legal risks go hand-in-hand with policy risks, which the company may face in the form of rate changes imposed by regulatory mandates, interruption in service due to extreme weather or emerging drinking water contaminants. CDP recently reported that the world's 50 largest companies expect almost US\$1 trillion at risk from climate impacts, and higher operating costs associated with legal and policy changes making up a significant part of this risk. Therefore, legal considerations represent an important part of our climate-based risk assessments.
Market	Relevant, always included	Shifts in supply and demand for water, wastewater services, and gas will invariably be affected by climate change. This risk is considered relevant to the company as water demands decrease with changing customer behavior and extreme weather affects water quality and quantity, in addition to a greater societal focus on water and gas conservation and efficiency. As a result, we consider climate-related market risks as our operations and services evolve over the short, medium and long-term periods.
Reputation	Relevant, always included	<p>Climate change leads to multiple challenges for water, wastewater, and gas utilities. Our company mission statement is "to sustain life and improve economic prosperity by safely and reliably delivering Earth's most essential resources to our customers and communities." We must do this while maintaining trust with our customers, regulators and governing state public utility commissions and agencies. Developing a strong ESG program with credibility and consistent improvement is vital to fulfilling our mission as well as earning the necessary trust to facilitate the relationships needed for operating our business and acquiring new systems.</p> <p>Speaking broadly, across the United States, there is growing awareness of critical infrastructure issues and rising expectations of utilities as a force for positive change. Thus, the public's confidence in our commitment to the community and stewardship of the planet is at the core of everything we do. Our actions surrounding climate change is one important element of this. Engaging with the customer, our regulators, investors, and our other stakeholders on climate change is important to us and something we will continue to address going forward. To underscore this importance, in 2020, Essential created and filled a new position of ESG Manager to address the need and effort required evolve our ESG handprint and engage our community of customers and investors. We also published an expanded and more extensive report on a new dedicated ESG microsite</p>

		(ESG.Essential.co).
Acute physical	Relevant, always included	Acute physical climate-related risks are always considered and are relevant in all states we operate. Increased precipitation leads to flooding and increasing temperatures lead to droughts. As a result of Hurricane Harvey, the customer demand was reduced during the storm and also during the recovery effort. This has direct financial implications as well. In an effort to better assess and manage the potential impacts from acute physical risks in the short, medium and long-term, we have explored tools such as WRI's Aqueduct Water Risk Atlas.
Chronic physical	Relevant, always included	<p>Chronic physical climate-related risks are always considered and are relevant. Due to increasing precipitation in various regions we operate, we are increasing capital expenses toward infrastructure to safeguard our dams and reservoirs. In addition to this, we assess and manage the potential impacts from chronic physical risks in the short, medium and long-term by preliminary analysis using tools like WRI's Aqueduct Water Risk Atlas and Global Flood Analyzer.</p> <p>The primary risks and effects are:</p> <p>Temperature – Increased cost and energy to treat water and wastewater and increased risk of exceeding water quality criteria. Strain on the electrical grid is another consideration. A reduction in average heating degree days due to climate change will also reduce natural gas demand.</p> <p>Drought – Not being able to meet customer demand, increased cost and energy to treat water, increased cost and energy to pump water and increased risk of exceeding water quality criteria.</p> <p>Flooding - Physical risk to facilities, increased cost and energy to treat water and wastewater, increased risk of exceeding water quality criteria for water and waste water. Also associated with flooding are often from other severe weather resulting in widespread and long-lasting power outages.</p>

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 & Primary climate-related risk driver

Chronic physical

Changes in precipitation patterns and extreme variability in weather patterns

Primary potential financial impact

Increased capital expenditures

Company-specific description

Wastewater I&I and SSO (Water and Wastewater Business Unit) - Protecting the environment from untreated sewage is a top priority as the owner and operator of wastewater systems. However, our company does acquire many systems that, due to historical lack of repair and investment, require time to make major infrastructure investments to prevent sewers from overflowing to the environment. Overflows can be caused during non-rain events by sewer collapses, electrical failures, and blockages. Also, extreme weather events such as hurricanes and tropical storms, increased frequency of extreme rainfall events, or climate-related trends can force a well-operated and maintained system to experience the occasional sanitary sewer overflow. Our company works to eliminate overflows through capital investments and operations, minimize and report overflows when they happen, and track the location, frequency, and duration of any overflows for future improvements.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

10,000

Potential financial impact figure – maximum (currency)

1,000,000

Explanation of financial impact figure

This estimate is based on impacts from physical climate-related risks only and not reputational risks associated with an interruption in service. The range of financial impact cited above is an estimate in terms of cost per wastewater system per storm event.

Cost of response to risk

1,000,000

Description of response and explanation of cost calculation

This financial impact is based on the past costs of capital investments and expenditures of additional infrastructure per collection system to address wet weather impacts, infiltration, and inflow as a result of increased regulations. Costs can vary significantly due to local/regional factors, so this figure is more directional in nature.

Comment

We perform routine O&M and capital projects to respond to and mitigate this risk by building resiliency throughout our wastewater systems.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Mandates on and regulation of existing products and services

Primary potential financial impact

Increased capital expenditures

Company-specific description

Cyanotoxins/CECs (contaminants of emerging concern) (Water and Wastewater Business Unit)- Blooms of toxin-producing cyanobacteria are expected to proliferate in surface water as global temperatures rise. These organisms produce cyanotoxins, a CEC that we have identified as a potential climate-related risk to our ability to provide safe and healthy drinking water to our customers. However, there is currently research being performed internally and externally to further assess this risk. Our company's response to regulations for CECs, and specifically cyanotoxins, depends on the speed and structure by which these regulations are implemented. The EPA has begun conducting studies to determine chronic and acute maximum contaminant level (MCL) in humans and aquatic life for the pollutants. Once these studies are complete and

potentially translated into regulatory policy, this could influence the regulations of water quality for surface water plants. How quickly these regulatory policies are adapted and implemented, and their results, will determine how soon and strict future CEC regulations in drinking water quality are. Our company's response to these future regulations depends on these results and we are actively monitoring the latest scientific and regulatory developments in this area.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

10,000

Potential financial impact figure – maximum (currency)

50,000

Explanation of financial impact figure

This range estimate refers to the annual financial impact for additional O&M to maintain and operate infrastructure, per surface water plant, to address cyanotoxins as a result of a likely scenario of increased regulations.

Cost of response to risk

1,000,000

Description of response and explanation of cost calculation

This financial impact is based on the capital investments and expenditures of the additional infrastructure, per surface water plant, to address cyanotoxins as a result of increased regulations.

Comment

We have already begun installation of treatment upgrades to address cyanotoxins in our Ohio subsidiary.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Mandates on and regulation of existing products and services

Primary potential financial impact

Increased indirect (operating) costs

Company-specific description

Disinfection by-products (Water and Wastewater Business Unit) - An unintended consequence of drinking water disinfection is the generation of disinfection by-products (DBPs). These chemical disinfection by-products, either organic or inorganic depending on the context, form as part of normal chemical disinfection treatment through the interaction between naturally occurring organic materials present in the source water and the treatment technology being used. In the case of our operations, the disinfectant most prone to cause DBP is chlorine. Chlorine dosage, and by extension the prevalence of DBP, is highly dependent on temperature. Through the use of scenario analysis, we determined the potential implications to our business operations under an optimistic scenario (RCP 2.6) and a Business-as-Usual pathway (BAU, RCP 8.5). We have determined that, based on this scenario analysis, there is a high likelihood that regulatory authority and requirements will also be highly dependent on similar climate-related trends. Our company may address increased DBPs as a result of treatment by implementing new filtration and treatment processes (e.g. organics removal, carbon treatment, membranes) for their effective removal prior to delivery, with the ability to scale these efforts based on the regulatory requirements, justified through the results of the scenario analysis.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

1

Potential financial impact figure – maximum (currency)

2

Explanation of financial impact figure

This financial impact is based on the capital investments and expenditures, along with corresponding operating costs, of the additional infrastructure required to remove disinfection by-products as a result of increased regulations as a cost (\$) per 1 million gallons of water produced .

Cost of response to risk

1,000,000

Description of response and explanation of cost calculation

This financial impact is based on the capital investments and expenditures of the additional infrastructure, per surface water plant, to address disinfection by products as a result of increased regulations.

Comment

We perform routine O&M and capital projects to respond to and mitigate this risk by building resiliency throughout our wastewater systems.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Downstream

Risk type & Primary climate-related risk driver

Technology
Transitioning to lower emissions technology

Primary potential financial impact

Increased capital expenditures

Company-specific description

Safe Hydrogen Concentration (Gas Business Unit) - Hydrogen blends as a sustainable fuel source are in their infancy. With this said, it is paramount to perform sufficient research and development to ensure safety in distribution and processing. Lack of adequate protocols and safety measures, if we ever were to blend hydrogen in our gas supply, could lead to significant liability issues. Hydrogen is a highly combustible gas. As an operator of a gas distribution network with safety always of the utmost priority, we wished to capture this potential downside risk of hydrogen blending. We also acknowledge, in C2.4, that there is upside opportunity as well with this nascent technology.

Time horizon

Long-term

Likelihood

Unlikely

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

Studies into whether hydrogen blending will be practical and safe for transport through distribution pipelines are in their infancy. We continue to monitor developments in understanding in both academic and industry circles. It is too premature to conduct a financial analysis at this time as there are too many variables preventing such estimates from being useful and actionable. Once we have a better understanding of what kind of adjustments to our infrastructure would be needed to transport hydrogen and to what degree it can be sourced across our footprint, it will be an appropriate time to conduct such a financial analysis surrounding a potential safety incident. We believe this is still at least several years away, if not longer.

Cost of response to risk

Description of response and explanation of cost calculation

As per the above explanation, it is too premature to estimate the cost of response to a risk that we do not have much actionable information about today. If we decide to utilize hydrogen blending, safety planning will be a core element of our strategy and we will be in a better position to examine the cost of precautions needed to mitigate such a risk.

Comment

Identifier

Risk 5

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Technology

Substitution of existing products and services with lower emissions options

Primary potential financial impact

Decreased revenues due to reduced demand for products and services

Company-specific description

Electrification (Gas Business Unit) - As climate change exacerbates and renewables comprise a higher proportion of electric generation, there may be a shift towards electrification of buildings and a shift away from natural gas usage to at least some degree. This may be market-driven or policy-driven in nature, or some combination of the two. This would constitute an inherent risk for our natural gas distribution business, absent of the potential to transition to economically and environmentally competitive technologies and alternative fuel sources. A potential decrease in natural gas demand could pose a financial impact to the company. Depending on the ultimate severity of the risk, which is difficult to assess at this time, there is a range of outcomes from a muted and limited adoption of electrification to some degree of stranded gas assets.

Time horizon

Long-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

If a move towards electrification occurs in the next few decades, it is difficult to assess today what primary drivers will contribute to this change, how regionalized it may be, and the pace at which it will occur. Thus, we believe it is too premature to perform a financial analysis to assess potential impact. A highly variable political, social, and economic environment contributes to this uncertainty. We do not believe this is a short-term risk and we forecast that natural gas demand will remain stable for quite some time. As such, we will continue to monitor this in future years and revisit the potential to conduct a financial impact analysis should electrification begin and accelerate in a manner that may impact our business.

Cost of response to risk

Description of response and explanation of cost calculation

Besides our aggressive emissions-reduction initiatives, which are well documented in this report, there are no specific responses to this risk we can take at this time. Thus, cost of response to risk is not applicable.

Comment

Identifier

Risk 6

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Technology
Unsuccessful investment in new technologies

Primary potential financial impact

Increased direct costs

Company-specific description

Late Entrant for Renewable Adoption (Gas Business Unit)- The risk of not adopting renewables could present a financial risk of late entry. The level of risk would be based on the economic comparison between future adoption and current premiums. The economic feasibility of acquiring renewable energy may fluctuate based on the market and policies.

Time horizon

Long-term

Likelihood

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)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The market for alternative fuels like renewable natural gas, hydrogen, and responsibly-sourced gas are currently developing and it is difficult to estimate at this time what the landscape will look like in several years. So much depends on volatile political, regulatory, and economic factors. As such, it is difficult to assess financial impact of the risk of late entry. Once a robust market for these alternative fuels develops, along with numerous production facilities, pricing forecasts will become more accurate and we will be able to revisit a financial assessment for this risk.

Cost of response to risk

Description of response and explanation of cost calculation

As stated above, it is difficult to assess the cost of response to this risk because the markets and development of such alternative fuels are only beginning to take shape and development can vary widely based on a range of external factors.

Comment

C2.4

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

Yes

C2.4a

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

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

Renewable Energy Use (Water and Wastewater Business Unit)- Essential has installed solar panels at two treatment plant locations in the State of Illinois - Manteno WWTP and Danville WTP. Through favorable grants for solar installations, Aqua Illinois is able to realize 25 to 50% savings for its retail power supply costs at both a water and wastewater treatment plant while supplying 75 percent of the plants' annual kWh requirement. This an example of how solar can reduce operating costs with the right mix of incentives and comparative grid supplier power costs either under an own-and-operate or PPA arrangement. This also includes off-site PPA agreements with retail providers. In 2019, we entered into an agreement which provides Aqua Texas, beginning in July 2020, with 25% solar power through an off-site PPA agreement. This agreement provide a cost advantageous scenario as compared to 100% grid power. We continually evaluate the cost of retail power, available grants, land availability, and PPA opportunities. As such, we are ready to act with agility on advantageous opportunities.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

100,000

Potential financial impact figure – maximum (currency)

1,000,000

Explanation of financial impact figure

Costs savings depend on location, grid retail power costs, and agreements. Estimates provided are representative of what can be reasonably achieved on an annual basis and the maximum represents what can possible for achievement, depending on the cost of retail grid power and incentives to allow us to deploy additional solar power.

Cost to realize opportunity

0

Strategy to realize opportunity and explanation of cost calculation

Through the PPA contract vehicle, the cost could be zero. Under the own-and-operate scenario, the costs could be \$1M-\$5M depending on the size of the solar asset and location.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

System Purchases due to water quality and quantity issues (Water and Wastewater Business Unit) - Mergers and acquisitions as a growth strategy can allow for Essential to expand into new markets through opportunities that, in part, result from impacts of climate change. There are many factors that could lead municipalities to sell their systems, but as climate changes, water and wastewater systems become more complex to operate, require increased capital investment to meet change, and regulatory compliance becomes more complex. While these are the same risks identified as risks to our business, they are also present opportunities for acquisition. Fair Market Value (FMV) policies provide a mechanism for municipal systems to sell their water and wastewater systems. These municipalities seek a company such as Essential with broad expertise and experience, access to capital, and a strong understanding of current and future regulations and legislation. Through the use of scenario analysis, we have identified specific areas of operations and climate scenarios that would provide a strategic advantage on this front, leading to acquisitions that would improve service reliability and quality to local stakeholders.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

1,000,000

Potential financial impact figure – maximum (currency)

100,000,000

Explanation of financial impact figure

For a utility, climate change alone may not be the reason for a sale of water or wastewater system, but the impacts of climate change may be one of the considerations and perhaps a decision point for sale of a system. The expertise of the successful bidder to address climate change risk could also be a winning factor in the bid process. The figures cited are an estimate of financial impact which is variable based on the size and number of systems acquired.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

Costs for acquisition are already included in routine marketing and business opportunity budgets.

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Primary potential financial impact

Increased revenues through access to new and emerging markets

Company-specific description

Wastewater discharge reuse and purple pipe projects (Water and Wastewater Business Unit)- As climate change may alter precipitation patterns, a consequence of this may be the impact to groundwater and surface water quantity and quality in various regions. Reducing the demand for freshwater and reducing demand on less resilient sources of supply will require communities to consider alternatives sources and technologies. Irrigation is a significant demand on household water use and cooling for power generation and server farms requires significant water. If these uses for homes, businesses, technology, agriculture, and golf courses are to be maintained for growing populations, the treatment and reuse of wastewater for potable and other uses will need to be expanded. This may provide opportunities to add customers within a given service area or provide access to new communities and businesses that cannot meet their supply demands. The company is currently involved in several agreements in which it treats wastewater and returns the water to various fields, including golf courses, where the water is used for irrigation. This opportunity includes expanded services for wastewater effluent used in irrigation, as well as services to convert wastewater back to a fully potable source.

Time horizon

Long-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

100,000

Potential financial impact figure – maximum (currency)

5,000,000

Explanation of financial impact figure

This range represents annual revenue increase and is based on an increase in total water sales of 1%.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

We are unable to estimate costs at this time.

Comment

Identifier

Opp4

Where in the value chain does the opportunity occur?

Upstream

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Primary potential financial impact

Returns on investment in low-emission technology

Company-specific description

Hydrogen Blends (Gas Business Unit)- Advancements taking place surrounding hydrogen blends present the opportunity to reduce GHG emissions by integrating natural gas with hydrogen. While academic and industry research is underway to determine a safe blending ratio, a hydrogen-natural gas blend could significantly reduce emissions. At this time, until further research and feasibility studies are performed in the coming years, assessment of the scale and nature of this opportunity remains challenging.

Time horizon

Long-term

Likelihood

Unlikely

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

Studies into whether hydrogen blending will be practical and safe for transport through distribution pipelines are in their infancy. We continue to monitor developments in understanding in both academic and industry circles. It is too premature to conduct a financial analysis at this time as there are too many variables preventing such estimates from being useful and actionable. Once we have a better understanding of what kind of adjustments to our infrastructure would be needed to transport hydrogen and to what degree it can be sourced across our footprint, it will be an appropriate time to conduct such a financial analysis surrounding this opportunity. We believe this is still at least several years away, if not longer.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

As per the above explanation, it is too premature to estimate the cost of realizing this opportunity. We need to continue assessing developments in hydrogen research and see how a market can be economically scaled before being able to conduct a financial analysis. There are many variables in a landscape that involves quickly changing political, legal, and economic factors.

Comment

Identifier

Opp5

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

Primary potential financial impact

Returns on investment in low-emission technology

Company-specific description

New Technology (Gas Business Unit)- For purposes of brevity, this opportunity collectively includes adoption of carbon capture utilization and storage (CCUS), adoption of combined cooling, heating, and power (CCHP), and electric vehicles. Carbon capture, utilization, and storage will be paramount in reducing greenhouse gas emissions globally. Although further academic and industry research is necessary in the coming years, CCUS presents an opportunity in various respects, most notably if it can reduce emissions at the point of customer combustion. CCHP, particularly in cases where an alternative low or zero-emissions fuel source can be utilized, would be an

opportunity that can be realized in the future. We could leverage our existing expertise in natural gas-powered combined heat and power systems. Lastly, rapid developments are being made in the auto industry to electrify certain classes of vehicles. Electrifying our light vehicles over the coming years would provide an opportunity to reduce emissions and possibly reduce operating costs. This is the most certain of the three technologies at this time, but may have the smallest ultimate impact.

Note: The CDP Questionnaire only permits selection of one option for "Where in the value chain does this opportunity occur." Given the nature of this opportunity, we believe the applicable response is upstream, downstream, and direct operations.

Time horizon

Long-term

Likelihood

Unlikely

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

We believe it is too premature to be able to assess the financial impact of these technologies, especially CCUS as likely the most significant and material of the three highlighted in this opportunity. We are excited by the prospect of CCUS but its development is very uncertain at this time and difficult to assess.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

As per the above explanation, it is too premature to estimate the cost of realizing this opportunity. We need to continue assessing developments in carbon capture research and see how a market can be economically scaled before being able to conduct a financial analysis. There are many variables in a landscape that involves quickly changing political, legal, and economic factors.

Comment

Identifier

Opp6

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

Primary potential financial impact

Returns on investment in low-emission technology

Company-specific description

RNG Adoption (Gas Business Unit)- Renewable natural gas (RNG) or biomethane, is typically the result of anaerobic digestion of organic matter, such as manure, agricultural waste, food waste or landfill. RNG combines low or zero full-cycle carbon emissions with the high energy density and transportability of natural gas. It has the potential to reduce Scope 3 emissions when the utility owns the associated renewable credits. This opportunity reflects the potential for our company to source greater amounts of renewable natural gas in the coming years, especially if regulatory mechanisms are introduced to aid in this adoption.

Time horizon

Medium-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)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

As a regulated utility, we pass through the costs of gas to our customers. We would not directly financially profit from the use of RNG, but this adoption would have environmental and sustainability benefits.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

We are currently in the process of evaluating the cost to realize this opportunity, especially as this market quickly develops in the near term. At this time, we are unable to provide this financial estimate.

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?

Yes

C3.1b

(C3.1b) Does your organization intend to publish a low-carbon transition plan in the next two years?

	Intention to publish a low-carbon transition plan	Comment
Row 1	No, we do not intend to publish a low-carbon transition plan in the next two years	As per section C4, Essential has recently set an ambitious target: By 2035, we will reduce our Scope 1 and 2 emissions by 60% from our 2019 baseline. We also announced an aspiration to achieve net zero emissions. This target represents combined Scope 1 and 2 emissions reductions attributable to planned or ongoing initiatives that utilize existing technology. Thus, the reductions we project have a high degree of certainty. They are not based on speculative or yet unproven technologies. Essential has detailed all the initiatives that will contribute to this target publicly through our ESG website and shareholder events. We are actively researching and monitoring promising developments and initiatives for future implementation, but these are not included in our projected emissions reduction for 2035. We understand technological innovation will need to occur to reach net zero but are excited by the rapid pace of innovation in the industry. Our response to C3.1b may change in the future as we and our industry peers continue

		to assess opportunities and plan for an evolving economy. In the interest of transparency, we have elected to respond “no” for this year’s questionnaire until we are prepared to share a more defined plan for further emissions reductions beyond 2035 using new technology. We understand the importance of C3.1b and low-carbon transition plans, which is why climate matters and initiatives are a key part of our ongoing strategic discussions.
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C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

C3.2a

(C3.2a) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details
RCP 2.6 RCP 8.5	<p>In an effort to better incorporate the potential effects of climate change on our business, Essential has assessed climate-related risks and opportunities through the use of scenario analysis. The purpose of this is to prioritize climate-relevant risks and opportunities and evaluate the timeline for impact in order to make proactive management decisions. Consistent with the recommendations of the TCFD, we herein provide details of our organizations use of climate-related scenario analysis. Guidance on conducting both qualitative and quantitative scenario analysis comes from ‘Recommendations of the Task Force on Climate-Related Financial Disclosures’ (2017) to identify our most pertinent climate-related business risks (transition and physical) and opportunities under the 2°C warming scenario (RCP 2.6) and the greater than 2°C Business-As-Usual (RCP 8.5) warming scenario.</p> <p>To perform qualitative scenario analyses, we implemented an multi-step scenario development process in which we identified issues, key factors influencing those issues, driving forces, ranked them by importance and uncertainty, and created scenario matrices with axes of uncertainty. This was performed for water and wastewater operations and, separately, gas operations. Each matrix was given a meaningful name and described qualitatively in the form of a narrative. From these narratives we derived implications, allowing for future selection of leading indicators. Relevant stakeholders within Essential, including, but not limited to, management, operations personnel, and other individuals responsible for climate-related matters (as detailed in section C1) were asked to provide potential risk areas and the implications these risks areas could affect within Essential's operations profile. For water and wastewater operations, analysis was performed</p>

	<p>within three geographic regions: Northern Region (NJ, PA, OH, IL and IN), Mid South (VA and NC) and the Texas Region (TX). For gas operations, analysis was performed within the greater Pittsburgh metro area, as this constitutes almost the entirety of our operational footprint.</p> <p>We downloaded temperature and precipitation data from the downscaled CMIP5 climate data set for the period 1950-2099 under the RCP2.6 and RCP8.5 scenarios within the BCCAv2 ccs4 model run. This quantitative model data was then used in tandem with stakeholder feedback to produce several key rating indicators for each region that Essential operates in. These key rating indicators included a potential magnitude of impact (MOI) for the indicator on operations (MOI definition consistent with CDP terminology), the likelihood of impact (consistent with institutional knowledge and historic climate data), and cost (annualized cost impact on labor, control infrastructure, operations and maintenance, etc.). These key rating indicators were given individual weights and scores by interviewed stakeholders, on a scale from 0-3. These ratings were then compiled to generate a total implication score (TIS), representing the impact that any particular implication could have on Essential's operations and as to whether it was an opportunity or a risk. The TIS was then cross calculated with the relative urgency, a metric developed from the results of the RCP 2.6 and RCP 8.5 climate analysis. By analyzing the climate variability within the applicable time horizon, a branching logical flow diagram was generated, allowing for variable and dynamic decision making on the relative importance and timeliness of actions, based on an indicator's susceptibility to either climate scenario. The resulting modified impact score (MIS) included all relevant information pertinent to individual risk or opportunities, adjusted for climate impact, in a format designed for managerial and operational expedience.</p>
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C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Climate change presents risks and opportunities to utilities like ours involved in water and wastewater treatment and

		<p>gas distribution.</p> <p>Regarding the former, one example we are exploring and evaluating is using treated wastewater effluent for irrigation. This conserves freshwater, a resource growing scarcer, but also reduces the energy required for additional treatment at our plants. In 2020, we recycled to the groundwater recharge via spray irrigation, drip irrigation and subsurface infiltration approximately 526.6 million gallons of treated wastewater. This is 5% of the total wastewater treated in 2020, with the remainder safely discharged to streams, rivers, or lakes. Another example we are exploring and evaluating is acquisition of combined sewer and stormwater systems and upgrading the infrastructure to something more resilient and environmentally sound. Changing weather patterns are further exposing the need to upgrade such systems to ensure associated runoff issues do not occur.</p> <p>In our gas operations, there are numerous alternative fuels and emissions-reducing technologies we and other industry peers are exploring. Supplying an increased volume of renewable natural gas to our customers is one such example and we continue to assess development opportunities and potential partners in western Pennsylvania. We also are a leader in helping critical institutions implement efficient and resilient combined heat and power (CHP) solutions. Our highest profile project has been helping to develop Pittsburgh International Airport’s modern microgrid. Further, we have invested in efficient fuel cell technology through our partnership with WATT Fuel Cell Corp. and assist businesses in transitioning their gas-powered commercial fleet to more efficient natural gas vehicles.</p>
<p>Supply chain and/or value chain</p>	<p>Yes</p>	<p>As energy is a major input for treating water and wastewater in our business, we made a strategic decision to increase the resiliency of our energy supply through various alternative and renewable energy initiatives where permissible through state regulatory frameworks. Our water and wastewater business set a target for all grid power from non-regulated electric suppliers (in PA, OH, NJ, and IL) to be 100% renewable through Green-e certified wind RECs by 2022. The associated energy sourcing agreement started in January 2020. Additionally, in 2019, Aqua Texas signed a</p>

		<p>solar PPA agreement for 25% of the state operation's power.</p> <p>Regarding gas operations, Essential has six interconnects with landfills producing renewable natural gas (RNG). This gas is delivered directly into our pipeline system. In 2020, this measured to over 1.4 Bcf, or about 1.2% of our total gas throughput. About 56% of this RNG is transported by Essential into an interstate pipeline or to a third-party pool operator. The remaining 44% is directly purchased by Essential, blended with our traditional natural gas supply, and delivered directly to our customers. Essential does not currently purchase renewable credits associated with the physical supply of RNG due largely to least-cost gas procurement guidelines set by our regulators. Thus, we cannot apply this emissions reduction to our greenhouse gas inventory. However, we believe we play a constructive and positive role in the development and function of the RNG market across our footprint by facilitating trade and transport of this environmentally friendly energy source. Essential is also working with other companies on developing potential additional RNG interconnects in our service territory. We look forward to expanding the number of partnerships with producers in the region.</p>
Investment in R&D	Yes	<p>As climate-related risks and opportunities are identified, we must continue our research and development of new techniques to source, treat, and transport water and wastewater efficiently. Our systems must be climate resilient. For example, as discussed in the C2 section, we have defined risks and opportunities using the STEEP (Sociological, Technological, Economical, Environmental and Political) analysis method to evaluate both internal and external forces on their likelihood of occurrence and then on the magnitude of their impact. This analysis focuses our research on the most efficient and effective methods. We are investing in a state-of-the-art new lab at our headquarters in Bryn Mawr, PA and additional cutting-edge capabilities that will allow us to better respond to such emerging issues and devise sustainable solutions. We also continue to perform detailed research into innovative new technologies for our gas operations that can reduce or eliminate emissions.</p>
Operations	Yes	<p>Designing and implementing efficient and resilient infrastructure and operational processes has a dual purpose</p>

		<p>of addressing climate change and reducing financial costs. As we make improvements to our systems, we drive energy efficiency, conservation, and waste minimization. There are many examples of how we have made changes or decisions in our operations, both minor and major, and a number of these are included throughout this report.</p> <p>For example, in our water and wastewater operations, automation helps reduce energy needed to operate our systems. Another example is through management of our operations while utilizing production metrics such as kWh/1,000 gallons.</p> <p>Regarding our gas operations, in 2013, we launched our Long-Term Infrastructure Improvement Plan (LTIIP). The LTIIP is an aggressive 20-year effort to replace and upgrade over 3,000 miles of natural gas pipelines with new plastic pipelines that will not corrode. As a result of LTIIP, Essential has reduced leaks per mile of pipe surveyed (inclusive of distribution and gathering pipe) from 1.72 in 2017 to 1.33 in 2020, a 23% decrease.</p>
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C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Direct costs Indirect costs Capital expenditures	<p>Our financial planning process is influenced by climate change in several ways. The first relates to our procurement of energy. We are creatively and proactively assessing our energy supply options, which involve forward purchasing of renewable energy and investments in various renewable energy projects. These alter the cadence of our cash outflows and often have a larger outlay at the outset of a project before earning savings in subsequent periods. As a water utility operating in an energy-intensive industry, these decisions involve planning, coordination, and financial considerations to ensure we are increasing resiliency and maintaining affordability for customers for this vital resource.</p> <p>Treating our water and protecting our systems requires us to maintain constant focus on emerging contaminants. Always looking to the future, we have identified cyanotoxins, as one example, of an emerging</p>

		<p>contaminant impacted by climate change, as detailed in C2. We have worked hard, and will continue to do so, to ascertain the impact of climate change on our water systems in accordance with scientific research. Our researchers and engineers are devising treatment methods to address risks by emerging contaminants, such as cyanotoxins, and this often requires additional investment in new technologies or processes to increase the resiliency of our various water systems.</p> <p>Additionally, we seek to reduce water loss and leakage wherever possible. The more water we need to treat at our plants, the more energy we need to use as an organization. Upfront investment in infrastructure and systems creates efficiency in the future. We replace water mains and many miles of pipe regularly to ensure that our systems are efficient and result in less water loss. This requires significant capital investment to maintain our systems and ensure they are resilient. We have invested approximately \$3.5 billion in infrastructure improvements and replaced more than 1,300 miles of aging water main since 2012.</p> <p>Similarly, improving our gas system infrastructure, which is the most impactful emissions-reducing initiative across Essential, requires significant capital investment. We assess about 450,000 segments of pipe and assign a relative risk ranking based on probability of failure times and consequences to help us determine prioritization of action. The capital outlay varies from year to year, but we expect to spend approximately \$275 million or more each year. We are also utilizing various leak detection and operational technologies that carry additional costs but reduce methane leakage.</p>
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C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

We encourage our stakeholders to refer to our ESG Report published at ESG.Essential.co for more examples and detail of our investment in America’s critical infrastructure, which carries significant benefits in efficiency and emissions reduction on a mass scale.

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

Year target was set

2021

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2019

Covered emissions in base year (metric tons CO₂e)

616,652

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2035

Targeted reduction from base year (%)

60

Covered emissions in target year (metric tons CO₂e) [auto-calculated]

246,660.8

Covered emissions in reporting year (metric tons CO₂e)

594,476

% of target achieved [auto-calculated]

5.9936560653

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition

Well-below 2°C aligned

Please explain (including target coverage)

Gas distribution, water, and wastewater utility operations will contribute to our target, which apply to 100% of our Scope 1 and 2 emissions. While not formally validated by the Science-Based Targets Initiative, this science-based commitment is consistent with the rate of reduction necessary from 2020 to 2035 to keep on track with the Paris Agreement, which aims to limit a global temperature rise to well below 2 degrees Celsius. We engaged an expert third party, Villanova University, to conduct this analysis. This target represents combined Scope 1 and 2 emissions reductions attributable to planned or ongoing initiatives that utilize existing technology. Thus, the reductions we project have a high degree of certainty. They are not based on speculative or yet unproven technologies. We are actively researching and monitoring promising developments and initiatives for future implementation, but these are not included in our projected emissions reduction for 2035. We understand technological innovation will need to occur to reach net zero, for which we announced an aspiration, but are excited by the rapid pace of innovation in the industry.

Target reference number

Abs 2

Year target was set

2021

Target coverage

Business division

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2019

Covered emissions in base year (metric tons CO₂e)

131,181

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2035

Targeted reduction from base year (%)

61.8

Covered emissions in target year (metric tons CO₂e) [auto-calculated]

50,111.142

Covered emissions in reporting year (metric tons CO₂e)

124,257

% of target achieved [auto-calculated]

8.540782198

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition

Well-below 2°C aligned

Please explain (including target coverage)

This target refers to the component of the Essential-wide target (Abs1) relating to water and wastewater utility operations. In prior year's CDP submittal, we referred to this planned reduction of emissions, but this is now formalized as a target. We have set the target year as 2035, to be consistent with the Essential-wide target (Abs1), but we plan to achieve this water and wastewater operations target fully in 2022. While not formally validated by the Science-Based Targets Initiative, this science-based commitment is consistent with the rate of reduction necessary from 2020 to 2035 to keep on track with the Paris Agreement, which aims to limit a global temperature rise to well below 2 degrees Celsius. We engaged an expert third party, Villanova University, to conduct this analysis. This target will be achieved primarily through a contract with a retail power supplier for 100% wind power through Green-e Renewable Energy Certificates starting in 2022 for our deregulated power supply for our water and wastewater operations in PA, OH, NJ and IL. Starting June 1st, 2020, 25% of purchased power in TX has been contracted through a solar PPA. The benefits from the solar PPA and improved emission factors for both Market and Location based emission factor resulted in the 8.5% reduction in our emissions from our 2019 baseline. We will continue to evaluate opportunities to reduce emissions further and will need to balance these potential investments with the critical need to maintain affordable and safe water supply for customers. We are excited about the pace with which electric utilities and providers are shifting their portfolios to renewable generation, which we have not accounted for in this target but which presents opportunity for further emissions reduction in states where we don't not have the option to purchase renewable energy.

Target reference number

Abs 3

Year target was set

2021

Target coverage

Business activity

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2019

Covered emissions in base year (metric tons CO₂e)

485,471

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2035

Targeted reduction from base year (%)

59.51

Covered emissions in target year (metric tons CO₂e) [auto-calculated]

196,567.2079

Covered emissions in reporting year (metric tons CO₂e)

470,219

% of target achieved [auto-calculated]

5.2792661146

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition

Well-below 2°C aligned

Please explain (including target coverage)

This target refers to the component of the Essential-wide target (Abs1) relating to natural gas utility operations. While not formally validated by the Science-Based Targets Initiative, this science-based commitment is consistent with the rate of reduction necessary from 2020 to 2035 to keep on track with the Paris Agreement, which aims to limit a global temperature rise to well below 2 degrees Celsius. We engaged an expert third party, Villanova University, to conduct this analysis. This target will be achieved primarily through our Long-term Infrastructure Improvement Plan to replace 3,000 miles of leak-prone pipe over 20 years, our gathering system repair program, accelerated leak

detection and repair, fugitive gas reinjection during construction, and transitioning to compressed natural gas fleet vehicles where feasible. While Essential translates all emissions to a common CO₂e denomination, one should note that almost all Scope 1 and 2 emissions attributable to our gas utility are fugitive methane leaks from pipes. Thus, this target can also be thought of as a methane reduction target for Essential, as the water and wastewater utility's emissions are almost all carbon dioxide. Thus, we have opted not to include a separate methane-specific target in C4.2, as this would be rather duplicative and not add value to this disclosure. This target represents combined Scope 1 and 2 emissions reductions attributable to planned or ongoing initiatives that utilize existing technology. Thus, the reductions we project have a high degree of certainty. They are not based on speculative or yet unproven technologies. We are actively researching and monitoring promising developments and initiatives for future implementation, but these are not included in our projected emissions reduction for 2035. We understand technological innovation will need to occur to reach net zero, for which we announced an aspiration, but are excited by the rapid pace of innovation in the industry.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2021

Target coverage

Other, please specify

Water and wastewater operations in PA, OH, NJ, and IL

Target type: absolute or intensity

Absolute

Target type: energy carrier

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

Base year

2019

Figure or percentage in base year

5

Target year

2035

Figure or percentage in target year

100

Figure or percentage in reporting year

8.6

% of target achieved [auto-calculated]

3.7894736842

Target status in reporting year

New

Is this target part of an emissions target?

Yes, as noted in C4.1, this is the primary initiative that will help us achieve Abs2, which refers to the emissions reduction target we set for our water and wastewater operations.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

We have engaged in a contract with a retail power supplier for 100% wind power through Green-e Renewable Energy Certificates starting in 2022 for our deregulated power supply for our water and wastewater operations in PA, OH, NJ and IL. In prior year's CDP submittal, we referred to this initiative, but this is now formalized as part of our organizational emissions reduction targets. Thus, here, we have set the target year as 2035, to be consistent with the Essential-wide target (Abs1) and water and wastewater target (Abs2), but we plan to achieve this water and wastewater operations target fully in 2022.

C4.3

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

Yes

C4.3a

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

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	1	76,000
Implementation commenced*	1	288,891
Implemented*	2	5,600
Not to be implemented	0	0

C4.3b

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

Initiative category & Initiative type

Low-carbon energy consumption
Solar PV

Estimated annual CO2e savings (metric tonnes CO2e)

5,000

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

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

40,000

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

0

Payback period

No payback

Estimated lifetime of the initiative

6-10 years

Comment

Aqua Texas in 2019 entered into an agreement power to source about 25% of its electricity from renewable sources through a new seven-year solar PPA agreement with Texas-based NRG Energy that started June 1, 2020. This agreement will help our Texas operations reduce its carbon footprint, lower the company's overall energy spend, and locally source its renewable power to better serve water and wastewater customers state-wide.

Initiative category & Initiative type

Low-carbon energy consumption
Wind

Estimated annual CO2e savings (metric tonnes CO2e)

76,000

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

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

0

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

0

Payback period

No payback

Estimated lifetime of the initiative

3-5 years

Comment

Our water and wastewater business contracted with a retail power supplier for 100% wind power through Green-e Renewable Energy Certificates starting in 2022 for its deregulated power supply for our water and wastewater operations in PA, OH, NJ and IL. This initial contract is for a three-year period.

Initiative category & Initiative type

Energy efficiency in production processes
Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e)

600

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

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

100,000

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

300,000

Payback period

1-3 years

Estimated lifetime of the initiative

16-20 years

Comment

In response to asset energy efficiency metrics analysis, high energy and inefficient assets are being identified. Projects have been initiated to upgrade and right size pumps and motors which will reduce energy consumption considerably. These projects where uninitiated in 2020 and will be in 2021. The data analysis method that has identified these initial assets for further investigations is a continual process that continues to identify new energy efficiency projects for future years.

Initiative category & Initiative type

Energy efficiency in production processes
Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e)

288,891

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

0

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

4,000,000,000

Payback period

No payback

Estimated lifetime of the initiative

16-20 years

Comment

This item represents all major initiatives that contribute to our emissions reduction target for our gas operations. The emissions reduction figure includes capital expenditures and investments in equipment related to our Long-term Infrastructure Improvement Plan to replace 3,000 miles of leak-prone pipe over 20 years, our gathering system repair program, accelerated leak detection and repair, fugitive gas reinjection during construction, and transitioning to compressed natural gas fleet vehicles where feasible. The investment required only includes the lifetime program cost of the Long-Term Infrastructure Improvement Plan, as the other items are difficult to quantify at this time. Due to difficulty in cleanly categorizing this item in CDP’s questionnaire, we have labeled this under “Implementation Commenced”. Each year, we make additional progress on these multi-year programs and investments that will lead us to reach our emissions reduction target.

C4.3c

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

Method	Comment
Financial optimization calculations	The company utilizes a ROI-based methodology referred to as “8:1:5” in which projects are justified based roughly on project spend versus payback period. This mechanism is used to justify a variety of energy efficiency measures across our organization. For energy projects, the cost variance per- and post-project plus utility, state or federal incentives are the primary factors that influence the outcome of energy-based 8:1:5 projects. In 2020, the mechanism was also formalized through compensation practices, in which team members are monetarily rewarded for qualifying project proposals.
Other General infrastructure investment needs	As a regulated utility, our capital improvement plans and finances are presented to state public utility commissions in the establishment of customer rates. There is a need for modernized infrastructure and this is recoverable through rates we charge customers. As such, many of the investments cited are central to our business model and are beneficial to all our stakeholders and the environment as well. These are not often separate or isolated decisions made solely within the context of climate or environmental goals.

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?

No

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, 2019

Base year end

December 31, 2019

Base year emissions (metric tons CO₂e)

499,259

Comment

Gas Operations: 483,202

Water and Wastewater Operations: 16,057

Scope 2 (location-based)

Base year start

January 1, 2019

Base year end

December 31, 2019

Base year emissions (metric tons CO₂e)

125,908

Comment

Location-based Scope 2 emissions were not calculated for our gas operations for 2019. Given materiality, we have included market-based Scope 2 emissions for our gas operations in this figure.

Gas Operations: 2,269

Water and Wastewater Operations: 123,639

Scope 2 (market-based)

Base year start

January 1, 2019

Base year end

December 31, 2019

Base year emissions (metric tons CO₂e)

117,393

Comment

Gas Operations: 2,269

Water and Wastewater Operations: 115,124

C5.2

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

US EPA Center for Corporate Climate Leadership: Indirect Emissions From Purchased Electricity

US EPA Center for Corporate Climate Leadership: Direct Emissions from Stationary Combustion Sources

US EPA Center for Corporate Climate Leadership: Direct Emissions from Mobile Combustion Sources

US EPA Mandatory Greenhouse Gas Reporting Rule

US EPA Emissions & Generation Resource Integrated Database (eGRID)

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)

483,214

Start date

January 1, 2020

End date

December 31, 2020

Comment

Gas Operations: 467,063

Water and Wastewater Operations: 16,151

Year-on-year reduction primarily driven by gas pipeline replacement activities

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)

499,259

Start date

January 1, 2019

End date

December 31, 2019

Comment

Gas Operations: 483,202

Water and Wastewater Operations: 16,057

C6.2

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

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

We are reporting our emissions across 10 states. With over 100 utilities providing electric service to over 4,600 electrical utility accounts and three retail electric suppliers, we have focused on our deregulated states with retail electric suppliers in obtaining market-based emission factors. Market-based emission factors are used for to calculate CO2 emission for Illinois, Pennsylvania, New Jersey and Ohio. Both Constellation New Energy and Mid-America Energy Services replied with market-based emission factors for 2020. Our retailer supplier in Texas was not able to provide market-based emissions and recommended using EPA eGrid. For other regulated utilities in regulated states, or municipalities and co-ops, the most recent EPA eGrid2019 factors were utilized.

C6.3

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

Reporting year

Scope 2, location-based

124,727

Scope 2, market-based (if applicable)

111,262

Start date

January 1, 2020

End date

December 31, 2020

Comment

Gas Operations: 3,951 (location) and 3,156 (market)

Water and Wastewater Operations: 120,776 (location) and 108,106 (market)

Year-on-year Scope 2 emissions decrease primarily driven by Aqua Texas Solar PPA and various other factors.

Past year 1

Scope 2, location-based

125,908

Scope 2, market-based (if applicable)

117,393

Start date

January 1, 2019

End date

December 31, 2019

Comment

Gas Operations: 2,269 (market). Location-based Scope 2 emissions were not calculated for our gas operations for 2019. Given materiality, we have included market-based Scope 2 emissions for our gas operations in this figure.

Water and Wastewater Operations: 123,639 (location) and 115,124 (market)

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 gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

40,672

Emissions calculation methodology

This Scope 3 source is material only to water and wastewater operations and not to our gas operations and total company. However, we have elected to disclose this for transparency. Figures and descriptions relate solely to water and wastewater operations.

List of purchased chemicals from 2020 was provided by Purchasing Department. Emission factors for top bulk chemicals was gathered from Eco-invent 3 LCI and Agri-footprint-gross energy allocation database. Eco-invent 3 used a Market for Consequential systems approach LCA. LCI data for >95% of the sum of the bulk weight of chemicals was obtained.

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

0

Please explain

Many vendors for chemical are local and small business entities and do not provide supplier emission factors.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

48,207

Emissions calculation methodology

This Scope 3 source is material only to water and wastewater operations and not to our gas operations and total company. However, we have elected to disclose this for transparency. Figures and descriptions relate solely to water and wastewater operations.

Pipeline Infrastructure Replacement includes Ductile Iron and PVC Pipe and HDPE Pipe Replacement, backfill, and repavement of roads. Pipe replacement: Calculated using CO2 emissions factors for a cradle to grave life cycle from an LCI performed by the University of Tehran (Hajibabaei, Mohsen, et al. "Life Cycle Assessment of Pipes and Piping Process in Drinking Water Distribution Networks to Reduce Environmental Impact." Sustainable Cities and Society, vol. 43, Nov. 2018, pp. 538–549., doi:10.1016/j.scs.2018.09.014.) Note that due to negligible observed emissions

differences, HDPE and PVC were grouped together. Backfill: Cradle to grave emission factors were gathered from LCI data from Ecoinvent-3 for crushed and washed limestone, Consequential, systems, GLO. Asphalt: Emission factors for embodied energy of asphalt were gathered from an LCI done by the Michigan Technology University for the National Asphalt and Pavement Association.

Note: There was a 37% increase in miles of pipe replaced year-over-year (178 vs 130 in 2019)

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

0

Please explain

Vendors of ductile iron do not provide emissions information.

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

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

25,659

Emissions calculation methodology

This Scope 3 source is material only to water and wastewater operations and not to our gas operations and total company. However, we have elected to disclose this for transparency. Figures and descriptions relate solely to water and wastewater operations.

Emissions for fuel-and-energy-related activities was calculated using the methodology found in the Quantis Methodology and 2016 Registration Document. Scope 3 energy emissions = (Scope 1 x 0.25) + (Scope 2 x 0.20)

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

0

Please explain

Data from suppliers is not available

Upstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Please explain

This is included in purchased products and capital goods. For our water and wastewater utility, our upstream transportation and conveyance of water and waste water is included

in our Scope 1 and 2 emissions. We do not purchase or rely on other vendors to provide our raw source water or wastewater. This is also deemed not relevant or material for our gas distribution business.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

911

Emissions calculation methodology

This Scope 3 source is material only to water and wastewater operations and not to our gas operations and total company. However, we have elected to disclose this for transparency. Figures and descriptions relate solely to water and wastewater operations.

Emissions for wastewater sludge transportation for all wastewater operations in eight states were calculated based on reported Dry Metric Tones based on gallon equivalent based on 2% solids. Using trip length relevant CO₂, CH₄, and N₂O emissions factors per Medium- and Heavy-Duty Truck ton-mile from EPA (2020) Emissions Factors for Greenhouse Gas Inventories (<https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub>); and GWP conversion factors from CH₄ and N₂O to amount of CO₂.

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

0

Please explain

There are over 50 suppliers for transport services. Many are small businesses which do not track or account for emissions.

Business travel

Evaluation status

Not relevant, explanation provided

Please explain

This was calculated in 2019 for our water and wastewater business and accounted for only 0.1 % of total Scope 3 emissions. Business travel was significantly less in 2020 due to COVID restrictions and therefore considered not relevant. Similarly, this is immaterial for our gas operations, relative to downstream customer combustion of natural gas.

Employee commuting

Evaluation status

Not relevant, explanation provided

Please explain

This was calculated in 2019 for our water and wastewater business and accounted for only 2.2 % of total Scope 3 emissions. Employee commuting was significantly less in 2020 due to COVID restrictions and therefore considered not relevant. Similarly, this is immaterial for our gas operations, relative to downstream customer combustion of natural gas.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Essential does not have upstream leased assets.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Please explain

As a utility company which provides water and natural gas distributed through a pipe system directly to the customers' points of use, such emissions are already included in Scope 1+2. This is also true of effluent discharged from our system.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Please explain

As a water and gas utility, the natural resources we supply customers are already in a final state and do not require further processing.

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

8,533,075

Emissions calculation methodology

Emissions from the combustion of natural gas delivered to end-users calculated using U.S. EPA stationary combustion emission factors for natural gas.

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

0

Please explain

This item is relevant to our gas operations only and constitutes the only material Scope 3 item in Essential's enterprise-wide inventory.

In contrast, water is sold as a product which has a multitude of uses which may result in the heating of water and the use in industrial process. Essential does not have operational control or knowledge of how customers use water and therefore those impacts are not included.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Please explain

The natural resources we supply do not require end of life treatment.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Essential has no downstream leased assets.

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

Essential has no franchises.

Investments

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

725

Emissions calculation methodology

This Scope 3 source is material only to water and wastewater operations and not to our gas operations and total company. However, we have elected to disclose this for transparency. Figures and descriptions relate solely to water and wastewater operations.

Emissions based on market-based emission factors and 10% wind renewable energy credits. Also included are the emissions for fuel-and-energy-related activities, which

were calculated using the methodology found in the Quantis Methodology and 2016 Registration Document. Scope 3 energy emissions = (Purchased electric x 0.20). Essential's financial ownership of the Essential -ETC Water Solutions, LLC, is 49% of this joint venture. 100% of this joint venture's emissions are included in this accounting. Essential sold its share in this operation in December of 2020.

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

100

Please explain

Market-based emissions factors for Constellation Energy's supply of electricity were utilized.

Other (upstream)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

3,973

Emissions calculation methodology

This Scope 3 source is material only to water and wastewater operations and not to our gas operations and total company. However, we have elected to disclose this for transparency. Figures and descriptions relate solely to water and wastewater operations.

In addition to producing water, Essential also purchases water from adjoining interconnected water companies/systems. Purchased water contains embodied energy as it is processed and received under pressure. If Essential did not purchase this water, it would need to produce more water. As such, our Scope 1 and 2 emissions would increase proportionally. We calculated this figure based on Essential's own 2020 emission factors for each state, defined as Tonnes CO2e/Million Gallons x volume of purchased = Tonnes CO2e.

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

0

Please explain

We use our own state-defined emissions factors as a representative facsimile.

Other (downstream)

Evaluation status

Not relevant, explanation provided

Please explain

Essential has no other downstream emissions.

C6.7

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

No

C6.10

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

Intensity figure

0.41

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO₂e)

594,476

Metric denominator

unit total revenue

Metric denominator: Unit total

1,462,698

Scope 2 figure used

Market-based

% change from previous year

Direction of change

Reason for change

Our revenue (unit total revenue reported as thousands of dollars) varies based on several business factors, including capital project performance, acquisition efforts, general and administrative (G&A) costs, and volume water and wastewater processed.

Our gas business was a private company prior to acquisition by Essential in 2020. As such, we are unable to calculate and disclose such figures for 2019 and mark year-on-year change. Further, the 2020 revenue was pro-rated due to revenue prior to acquisition on March 16th not publicly disclosed in Essential's 10-K. As such, this intensity figure is an estimate rather than an exact calculation.

For our gas business, 2020 intensity figure (calculated in a similar fashion to total Essential) was 0.77. For our water and wastewater business, 2020 intensity figure (calculated in a similar fashion to total Essential) was 0.13 and declined 10.2% year-over-year.

Intensity figure

1.16

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO₂e)

99,474

Metric denominator

Other, please specify
Millions of gallons of water produced

Metric denominator: Unit total

85,434

Scope 2 figure used

Market-based

% change from previous year

7.1

Direction of change

Decreased

Reason for change

The combination of reduced annual Scope 1 & 2 carbon emissions resulting from lower market-based emission factors for our power supply and increase in energy efficiency resulted in the year-over-year decrease.

Intensity figure

2.16

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO₂e)

24,783

Metric denominator

Other, please specify
Millions of gallons of wastewater treated

Metric denominator: Unit total

11,474

Scope 2 figure used

Market-based

% change from previous year

2.7

Direction of change

Decreased

Reason for change

The combination of reduced annual Scope 1 & 2 carbon emissions resulting from lower market-based emission factors for our power supply and increase in energy efficiency resulted in the year-over-year decrease.

Intensity figure

3.03

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO₂e)

470,219

Metric denominator

Other, please specify

Millions of cubic feet of gas delivered

Metric denominator: Unit total

155,400

Scope 2 figure used

Market-based

% change from previous year

Direction of change

Reason for change

Our gas business was a private company prior to acquisition by Essential in 2020. As such, we are unable to calculate and disclose revenue figures for 2019 and mark year-on-year change.

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 CO ₂ e)	GWP Reference
CO ₂	83,044.5	IPCC Fourth Assessment Report (AR4 - 100 year)
CH ₄	400,103.2	IPCC Fourth Assessment Report (AR4 - 100 year)
N ₂ O	66.2	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

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

Country/Region	Scope 1 emissions (metric tons CO ₂ e)
United States of America	483,214

C7.3

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

By business division

By activity

C7.3a

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

Business division	Scope 1 emissions (metric ton CO ₂ e)
Aqua Illinois	1,524
Aqua Indiana	321
Aqua North Carolina	2,961
Aqua New Jersey	587

Aqua Pennsylvania	6,373
Aqua Ohio	1,976
Aqua Virginia	688
Aqua Texas	1,721
Peoples Natural Gas Company	367,678
Peoples Gas Pennsylvania	78,475
Peoples Gas West Virginia	4,829
Peoples Gas Kentucky	1,553
Delta Natural Gas Company	14,528

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
Water Production	15,371
Wastewater Treatment	780
Natural Gas Distribution	467,063

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 for in Scope 2 market-based approach (MWh)
United States of America	124,727	111,262	298,182	31,332

C7.6

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

By business division

By activity

C7.6a

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

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Aqua Illinois	14,279	9,764
Aqua Indiana	6,287	6,287
Aqua North Carolina	9,135	9,135
Aqua New Jersey	3,741	3,808
Aqua Pennsylvania	49,894	51,203
Aqua Ohio	18,729	13,689
Aqua Virginia	3,137	3,137
Aqua Texas	15,575	11,083
Peoples Natural Gas Company	3,203	2,696
Peoples Gas Pennsylvania	490	301
Peoples Gas West Virginia	65	40
Peoples Gas Kentucky	5	3
Delta Natural Gas Company	188	116

C7.6c

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

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Water Production	93,510	84,103
Wastewater Treatment	27,266	24,004
Natural Gas Distribution	3,951	3,156

C7.9

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

Decreased

C7.9a

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	2,500	Decreased	0.4	In June 2020 the TX solar PPA contract started which resulted in a net increase of 6,500 MWh of renewable energy. eGrid emission factors were used to calculate the net positive CO2e benefit from the project.
Other emissions reduction activities	43,853	Decreased	7.1	Gas pipeline replacement activities contributed to emissions reduction.
Divestment				No significant divestments during reporting period.
Acquisitions				No significant acquisitions during reporting period. The Peoples Gas Acquisition was accounted for in the new 2019 baseline and, thus, is not a driver of change relating to the previous year.
Mergers				No significant mergers during reporting period.
Change in output	15,815	Increased	2.6	The volume of natural gas lost to atmosphere resulting from gas equipment blowdowns increased from 48,003 MCF to 82,646 MCF.
Change in methodology	9,409	Increased	1.5	Updated accounting methodology to align with US EPA GHG Inventory for fugitive emissions from storage facilities.
Change in boundary				No changes in boundary occurred in 2020.

Change in physical operating conditions				No significant changes in physical operation conditions.
Unidentified				Not applicable
Other				Not applicable

C7.9b

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

Market-based

C8. Energy

C8.1

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

More than 5% but less than or equal to 10%

C8.2

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

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

C8.2a

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	417,503	417,503
Consumption of purchased or acquired electricity		31,332	294,686	326,018
Consumption of self-generated non-fuel renewable energy		3,496		3,496
Total energy consumption		34,828	712,189	747,017

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	No
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	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

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

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

310,482

Emission factor

53.06

Unit

kg CO₂e per million Btu

Emissions factor source

Center for Corporate Climate Leadership GHG Emission Factors Hub, Emission Factors for Greenhouse Gas Inventories - Last

Modified: 1 April 2021; Mobile Combustion CO₂ Emission Factors.

Comment

None

Fuels (excluding feedstocks)

Compressed Natural Gas (CNG)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

2,974

Emission factor

1.92173

Unit

kg CO₂ per m³

Emissions factor source

Center for Corporate Climate Leadership GHG Emission Factors Hub, Emission Factors for Greenhouse Gas Inventories - Last Modified: 26 March 2020; Mobile Combustion

CO₂ Emission Factors. Converted 0.05444 kg CO₂ per scf * 35.3 scf per m³ = 1.92173 to Kg CO₂ per m³

Comment

None

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

82,832

Emission factor

8.78

Unit

kg CO2 per gallon

Emissions factor source

Center for Corporate Climate Leadership GHG Emission Factors Hub, Emission Factors for Greenhouse Gas Inventories - Last Modified: 26 March 2020; Mobile Combustion CO2 Emission Factors.

Comment

None

Fuels (excluding feedstocks)

Diesel

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

21,216

Emission factor

10.21

Unit

kg CO2 per gallon

Emissions factor source

Center for Corporate Climate Leadership GHG Emission Factors Hub, Emission Factors for Greenhouse Gas Inventories - Last Modified: 26 March 2020; Mobile Combustion CO2 Emission Factors.

Comment

None

C8.2d

(C8.2d) 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	3,496	3,496	3,496	3,496
Heat	18,994	18,994	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C8.2e

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

Sourcing method

Standard product offering by an energy supplier supported by energy attribute certificates

Low-carbon technology type

Wind

Country/area of consumption of low-carbon electricity, heat, steam or cooling

United States of America

MWh consumed accounted for at a zero emission factor

31,332

Comment

National Green-e Energy Certified New Renewable

C9. Additional metrics

C9.1

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

Description

Energy usage

Metric value

3.1

Metric numerator

Annual kilowatt hours

Metric denominator (intensity metric only)

Thousand gallons of water produced

% change from previous year

3

Direction of change

Decreased

Please explain

The company, in 2018, added kWh/1,000 gallon as a metric to its management scorecard. Managers are incentivized to maintain and lower energy consumption as measured by this metric. Since we started monitoring this, the three primary factors that have led to changes in energy intensity are: greater energy efficiency efforts at the local level, utilization of a more-energy efficient mix of pumping assets, and year-on-year changes in heating degree days. Changes in regulations may lead to more energy-intensive practices over time, making long-term trend analysis difficult.

Description

Other, please specify
Quantity of gas leaks

Metric value

621

Metric numerator

Quantity of gas leaks

Metric denominator (intensity metric only)

N/A

% change from previous year

Direction of change

Please explain

This is climate-related metric is included as a component of Essential's Short Term Incentive Awards, in order to promote accountability for performance in this area. In

2020, we recorded 621 gas leaks, which is well below our targeted achievement of 860. We will set out to track and disclose this each year.

Description

Other, please specify

Quantity of gas distribution pipe miles replaced versus planned replacements

Metric value

104

Metric numerator

Gas distribution pipe miles replaced

Metric denominator (intensity metric only)

Planned gas distribution miles replaced

% change from previous year

0

Direction of change

No change

Please explain

This is climate-related metric is included as a component of Essential's Short Term Incentive Awards, in order to promote timely replacement of gas main, which reduces emissions. In 2020, we experienced 104% achievement over plan, which is the same level of achievement over plan that we experienced in the previous year.

Description

Energy usage

Metric value

5.4

Metric numerator

Annual kilowatt hours

Metric denominator (intensity metric only)

Thousand gallons of wastewater treated

% change from previous year

13

Direction of change

Increased

Please explain

The company, in 2018, added kWh/1,000 gallon as a metric to its management scorecard. Managers are incentivized to maintain and lower energy consumption as measured by this metric. It is expected that this figure may increase in some years because inflow and infiltration, influenced by rainy weather, influences greatly. 2019 was an abnormally rainy year. This led to more wastewater treated, but not necessarily a corresponding increase in energy used due to the physics of water moving downhill through our pipeline network. Additional rainwater can reduce the energy needed to move water through our system due to gravity.

Description

Other, please specify
Methane Emissions Intensity

Metric value

0.48

Metric numerator

Natural gas distribution

Metric denominator (intensity metric only)

Total methane throughput

% change from previous year

Direction of change

Please explain

This is the first year Essential has calculated methane emissions intensity. See below for various methodologies, consistent with Natural Gas Sustainability Initiative reporting protocol:

NGSI Methane Emissions Intensity, GHGRP emission factors for mains and services- 0.4828%

Normalized NGSI Methane Emissions Intensity, GHGRP emission factors for mains and services- 0.5600%

NGSI Methane Emissions Intensity, GHG Inventory emission factors for mains and services- 0.2527%

Normalized NGSI Methane Emissions Intensity, GHG Inventory emission factors for mains and services- 0.2931%

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 third-party verification or assurance

C10.1a

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

Verification or assurance cycle in place

Annual process


Status in the current reporting year

Complete

Type of verification or assurance

Moderate assurance

Attach the statement

 CDP Assurance Essential 2021 Final Signed.pdf

Page/ section reference

Page 1 of verification letter

Relevant standard

The Climate Registry's General Verification Protocol

Proportion of reported emissions verified (%)

3

C10.1b

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

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process


Status in the current reporting year

Complete

Type of verification or assurance

Moderate assurance

Attach the statement

 CDP Assurance Essential 2021 Final Signed.pdf

Page/ section reference

Page 1 of verification letter

Relevant standard

The Climate Registry's General Verification Protocol

Proportion of reported emissions verified (%)

97

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Moderate assurance

Attach the statement

 CDP Assurance Essential 2021 Final Signed.pdf

Page/ section reference

Page 1 of verification letter

Relevant standard

The Climate Registry's General Verification Protocol

Proportion of reported emissions verified (%)

97

C10.2

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

Yes

C10.2a

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

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C7. Emissions breakdown	Product footprint verification	No standard was utilized	Water and wastewater operations emissions are calculated from base data at the operating unit level for all Scope 1 & 2 emissions and aggregated to the company level. All calculations were verified for the emissions breakout.

C11. Carbon pricing

C11.1

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

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

C11.2

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

No

C11.3

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

No, and we do not currently anticipate doing so in the next two years

C12. Engagement

C12.1

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

Yes, our suppliers

Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Innovation & collaboration (changing markets)

Details of engagement

Other, please specify

As a large electricity user, the company looks to our retail power suppliers with innovative power purchase agreements that allow us to control expenses, but focus on green and renewable power purchase options

% of suppliers by number

100

% total procurement spend (direct and indirect)

100

% of supplier-related Scope 3 emissions as reported in C6.5

0

Rationale for the coverage of your engagement

We request that our retail power suppliers provide energy portfolio mixes that offer both lower utility rates and increased options for green power purchases. We work with local utilities to utilize energy efficiency incentives. In some of our larger systems, we participate in energy load shedding events to take power off the grid during the highest demand times of the year. This is the result of active collaboration with our power providers to set up and participate in these programs, thus stabilizing the electric grid, and reducing the need for additional fossil fuel-consuming electric generation plants.

Impact of engagement, including measures of success

In 2019, in our Texas operations, we signed a solar PPA agreement which will deliver about 25% solar power for the state's operations starting in July of 2020. All of these improvements enable us to save on expenses which benefits our customers while reducing our Scope 2 emissions. In 2022, all grid power from non-regulated water and wastewater utilities (for PA, OH, NJ, and IL) will be 100% renewable through Green-e certified wind RECs.

Comment

Our power suppliers are aware of the company's desire to source renewable energy and are engaging the company with potential and initiative solutions that can also be delivered at grid parity pricing. All electrical power in deregulated markets is serviced by

retail power suppliers therefore 100% of our electrical supply is through our suppliers. Purchased electric is a Scope 2 emission therefore the Scope 3 value field is zero.

Type of engagement

Compliance & onboarding

Details of engagement

Climate change is integrated into supplier evaluation processes

% of suppliers by number

100

% total procurement spend (direct and indirect)

100

% of supplier-related Scope 3 emissions as reported in C6.5

100

Rationale for the coverage of your engagement

We have begun a more formal process of screening, requiring all our major suppliers, new and old, to re-sign our Code of Conduct periodically. The Code of Conduct was amended in 2020 to expand and enhance language surrounding our expectations of our suppliers' environmental and climate-related impacts and performance. We are committed to purchasing from suppliers that strive to improve the environmental quality of our operations. We seek to do business with suppliers who share our concerns for, and commitment to, preserving the environment. Our suppliers will act in accordance with all applicable laws, codes, and regulations regarding environmental protection and sustainability. Suppliers will use reasonable efforts to minimize pollution and improve in environmental protection and sustainability. Moving forward, as existing contracts expire, we will strongly encourage our major suppliers, where applicable, to track, and improve on their environmental footprint as we continue to explore innovative ways to reduce our carbon emissions. Energy use and greenhouse gas emissions are noted explicitly in the document and our Sustainability and Environmental Policy is linked as well, which has a section dedicated to climate change. Specifically, we will also be asking our pipe and chemical vendors to begin providing Cradle-to-Gate emissions factors for selected products and incorporate this practice into our bid evaluation.

Impact of engagement, including measures of success

As these efforts evolve and mature, we continue to assess how to best measure impact of such engagement, as well as expand our dialogue with suppliers. We hope to use the information collected from suppliers to both make more informed and responsible choices in procurement, as well as encourage our existing suppliers to reduce

Comment

C12.1b

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

Type of engagement

Education/information sharing

Details of engagement

Other, please specify

Engagement with customers on water efficiency, which reduces energy needed to treat and heat water. Also, engagement with customers on natural gas efficiency.

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

100

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

We are very aware of the relationship between volume of water used by our customers and climate change. The higher the volume of water demanded by our customers, the more energy we must use to treat and deliver it. Further, our customer often uses energy in the home to heat water for various purposes. Therefore, encouraging efficiency in water use achieves a dual purpose of conserving precious water resources and reducing climate change impact through energy use. While we do not explicitly make this connection to climate change to our customers in our communications, we believe the trend of American homes becoming more efficient with water usage is materially reducing the impact of inherently energy-intensive water utility operations. Similarly, we are aware of the large amount of Scope 3 emissions driven by customer combustion of gas. We encourage customers to use less gas and provide many tips to do so. This also helps to keep energy costs affordable, which is critical for households especially during the cold winter months, as our gas operations are primarily located in western Pennsylvania.

Impact of engagement, including measures of success

There are several methods by which we engage customers on water and gas efficiency. We operate an interactive website called aquawatersmart.com which allows customers to click on areas of a house, which displays various tips for conserving water. The user can share tips directly through social media and download various infographics. We provide gas usage reduction tips on our Peoples Gas website as well. We also send tips and communications directly to customers by email and mail, including through our welcome kit brochure. We ensure customer portals provide tools and means by which customers can closely monitor their water and gas usage. Additionally, we want to ensure we provide as much guidance and support as possible to economically

distressed and low-income customers to reduce their bills through water efficiency, among other initiatives. We send an "eco-kit" to these customers which include an efficient showerhead as well as other materials that improve water usage in a home. We will also send water conservation tips to these customers. While it is difficult to isolate or quantify the exact impact of these initiatives (greater adoption of efficient appliances is a national trend we cannot credit solely to our engagement with customers), our customers' households are becoming more efficient, in line with trends other utilities are seeing. We believe engagement of the customer by utilities such as ours is a material driver of this change.

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?

- Trade associations
- Funding research organizations
- Other

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

National Association of Water Companies (NAWC), American Water Works Association (AWWA), Water Environment Federation (WEF), American Gas Association (AGA), Marcellus Shale Coalition (MSC), Edison Electric Institute (EEI)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Each of these organizations has publicly published policy positions on climate change. In the context of this CDP questionnaire, it would be difficult to fully include or paraphrase each of these documents, but we encourage our stakeholders to visit the associated websites and learn more about how our water and gas utility industries are addressing climate change and environmental sustainability. We will provide as short excerpt of each organization's position below and do not note any significant areas of disagreement:

NAWC: “NAWC members are committed to protecting the environment and to using our most precious resource – water – as wisely as possible. Improving environmental stewardship is one of the most often-cited reasons municipalities give for deciding to work with a water company. For water companies, sustainability is essential. The fact is water companies are helping to lead the way on water conservation with green, energy-saving initiatives that make a difference for the communities they serve.”

AWWA: “The American Water Works Association (AWWA) recognizes that global climate change and inherent variability are having impacts on the hydrologic cycle, source water, and water demands that differ from statistical trends based on historical records, thus impacting the anticipated quantity, quality, and reliability of water supplies. Two principal goals for water utilities in addressing impacts due to climate change and inherent variability are: to assess risk and uncertainty; and to develop and take actions that improve resiliency and sustainability in utility management, facilities and water sources.”

WEF: “No other resource is likely to be more affected by climate change than water, as precipitation patterns change, sea levels rise, and water quality degrades. The nation’s drinking water and wastewater infrastructure is already in need of significant investment to maintain current levels of service over the coming decades. Climate change will stress the system further. Adaptation approaches will in many cases require additional resources. Federal, state and local funding must continue to be directed to the Water Sector to adapt infrastructure and water supplies to climate change.”

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

We provide technical information and participate on various committees in AWWA and NAWC (i.e. AWWA Energy Committee) related to climate change and resiliency.

Due to text limits in "Please explain the trade association's position" response, please see below for the remaining component:

AGA: “The American Gas Association is committed to reducing greenhouse gas emissions through smart innovation, new and modernized infrastructure, and advanced technologies that maintain reliable, resilient, and affordable energy service choices for consumers.”

MSC: “We understand that the climate continues to change and that the associated risks require broad-based, collaborative action. We recognize that affordable, reliable energy sources – including and especially natural gas, are essential to sustaining and improving modern-life and economic prosperity, as well as combatting global poverty.”

EEI: "Global climate change presents one of the biggest energy and environmental policy challenges this country has ever faced. EEI member companies are committed to addressing the challenge of climate change and have undertaken a wide range of initiatives over the last 30 years to reduce, avoid or sequester GHG emissions. Policies to address climate change should seek to minimize impacts on consumers and avoid harm to U.S. industry and the economy."

C12.3d

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

Yes

C12.3e

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

We engage with policy makers on climate-related issues. We are a heavily regulated company. As such, we routinely engage with elected representatives of the government, environmental regulators and policy makers, and local officials on climate-related issues. We encourage actions to combat climate change and both remind and educate others on the linkages between climate change and impacts on water supply.

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?

Our company's overall climate strategy is aligned with our government affairs activities. Given the limited size of our company, there is very close oversight of all our engagement with public officials by senior management. There are several members of senior management, listed and described in this questionnaire, that are responsible for climate change risk management and mitigation in addition to being involved in all government affairs policy-related decision making. This helps to ensure our company is consistent with respect to climate change and that our behaviors and actions are representative of this CDP climate change disclosure.

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

.

Page/Section reference

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

Other, please specify

Our ESG report contains a wide breadth of narratives ranging from waste to energy consumption to industry partnerships

Comment

Our ESG microsite, ESG.Essential.co, is an award-winning, dynamic, and easy-to-use one-stop destination for our stakeholders to access all information related to environmental, social, and governance. It contains our ESG Report, TCFD Report, and other information.

Publication

In voluntary communications

Status

Complete

Attach the document

.

Page/Section reference

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

Comment

Our TCFD Report contains many of the same responses as we provide for CDP, but in a much-abbreviated format. This is provided on our ESG microsite, ESG.Essential.co.

Publication

In voluntary communications

Status

Complete

Attach the document

.

Page/Section reference

Content elements

Emissions figures

Other metrics

Comment

We disclose detailed pipeline emissions data through a sustainability template provided by the American Gas Association. This is provided on our ESG microsite, ESG.Essential.co.

C15. 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.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	ESG Manager	Environment/Sustainability manager

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms