Essential™
Providing natural resources for life.

2023

TCFD REPORT

INTRODUCTION

Essential Utilities understands the urgency of the Paris Agreement and the UN Intergovernmental Panel on Climate Change's science-based target of limiting the global temperature increase to well below 2 degrees Celsius. Addressing climate change requires a holistic management approach and tracking of our Scope 1, 2 and 3 greenhouse gas (GHG) emissions. Our executive and management teams understand there are two distinct elements of climate change: adaptation and mitigation. Essential is addressing both items and has implemented a robust management system to identify associated risks and opportunities. Essential's management of climate change matters consists of significant board-level oversight of climate-related issues through various channels and reporting paths to review the risks facing the organization and evaluate our operations with respect to many issues, including the risk factors associated with climate change. At the management level, Essential's ESG Oversight Committee, a group of about a dozen of the company's senior leaders from across the organization as well as the CEO, meet at least once each quarter to discuss these topics and there are numerous other opportunities each month for various members of senior management to engage on climate change matters.

This Task Force on Climate-related Financial Disclosure (TCFD) report aims to provide our stakeholders with information about our climate change governance framework, strategy, risks and opportunities, relevant metrics and targets. We provide much more information on Essential's climate scenario analysis, board and executive oversight, risks, and opportunities in our CDP submission. This report outlines and specifies Essential's approach to evaluating and mitigating climate change risks and opportunities and is guided by the recommendations of the TCFD, presenting information for calendar year 2023.

About Us

Essential Utilities, Inc., (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 5.5 million people in Pennsylvania, Ohio, Texas, Illinois, North Carolina, New Jersey, Indiana, Virginia, and Kentucky under the Aqua and Peoples brands. One of our largest operating subsidiaries, Aqua Pennsylvania, Inc. (Aqua Pennsylvania), provides water or wastewater services to approximately one-half of the total number of water or wastewater customers we serve. These customers are 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 or wastewater utility subsidiaries provide similar services in seven additional states. Our Peoples subsidiaries provide natural gas service to approximately 744,000 customers in western Pennsylvania and Kentucky. Approximately 95% 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 Resources, Inc. and certain other non-regulated subsidiaries of Peoples. Aqua Resources offers, through a third-party, water and sewer service line protection solutions and repair services to households. Other non-regulated subsidiaries of Peoples provide utility service line protection services to households and operate gas marketing and production businesses.

Corporate Profile

ESSENTIAL

Revenue
$2.05B

Employees (full-time)
3,200+

People Served
5.5M

Customer Connections
1.9M

GAS

Gas Utility Customer Connections
0.8M

Gas Delivered to Customers
146.4Bcf

WATER AND WASTEWATER

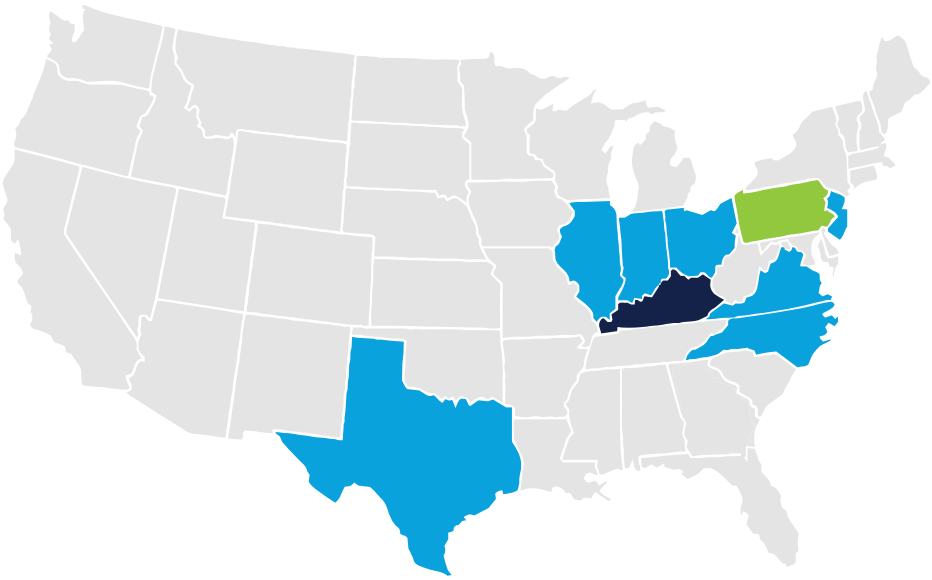
Water and Wastewater Utility Customer Connections
1.1M

Gallons of Drinking Water Produced
86.0B

Water Systems
1,513

Gallons of Wastewater Treated
11.4M

Wastewater Systems
237



States

Illinois
Indiana
Kentucky
New Jersey
North Carolina
Ohio
Pennsylvania
Texas
Virginia

- Aqua and Peoples
- Peoples Only
- Aqua Only

Board Oversight

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 program, strategy, and activities. At least quarterly, an update is presented to the corporate governance committee of the board on ESG matters. Subject matter experts and leaders across Essential's operations frequently present to the board on various matters relevant to ESG and sustainability. Key updates 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 where Essential provides the board with frequent updates and education. Each year the full board convenes for a dedicated 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.

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. 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. We are proud to have multiple board members with climate competence and believe this both enriches dialogue at meetings and helps inform our overall climate strategy.

Senior Management

Essential has various reporting pathways, touch points, and methods to actively manage climate-related issues. For example, climate-related issues through the 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. Our CEO 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 the 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 Aqua and Peoples Gas Presidents are responsible for ensuring physical assets are protected from climate-related issues and implementing operational procedures and efficiencies to reduce energy consumption. The Chief Environmental, Safety, and Sustainability Officer reports to the General Counsel and downward to each state president and corporate engineering functions to provide the overarching guidance and oversight in managing and evaluating climate-related risks.

Since 2020, Essential Utilities has had a dedicated ESG Manager position. This is a full-time role that 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. The ESG Manager works closely with the VP Chief Environment, Safety, and Sustainability Officer, who provides executive oversight over the climate reporting process. 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 of ESG initiatives, emerging industry topics 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. The ESG Manager is responsible for leading the committee and keeping the group abreast of such developments in addition to consolidating collective ESG disclosure efforts. We remain dedicated to continually strengthening our governance on climate-related matters in recognition of its critical importance to our society, planet, and company.

STRATEGY AND RISK MANAGEMENT

Climate Change Impact on Business Strategy and Financial Planning

Climate change presents risks and opportunities to water, wastewater, and gas utilities. Designing and implementing efficient and resilient infrastructure and operational processes has a dual purpose of addressing climate change and reducing financial costs, and as we make improvements to our systems, we drive energy efficiency, conservation and waste minimization. As one example, we utilize automation and efficient pumping to help reduce the energy needed to operate our systems. Operational efficiency is monitored and managed through production metrics such as kWh/1,000 gallons to monitor trends and identify opportunities.

Essential is innovating our climate strategy by exploring and evaluating various technologies and renewable fuels that can reduce GHG emissions throughout the gas value chain. We are also exploring and evaluating the acquisition of combined sewer and stormwater systems and upgrading the infrastructure to be 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. We are continually thinking about how to engineer resilient infrastructure for sustainable communities.

Our financial planning process is influenced by climate change in several ways. We are creatively and proactively assessing our energy supply options, which involve forward purchasing of renewable energy and investments in various renewable energy projects. 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. 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. We are also utilizing various leak detection and operational technologies that carry additional costs but reduce methane leakage.

Determining Climate-Related Risks and Opportunities Through Scenario Analysis

Evaluating exposure to climate-related risks and opportunities over a range of time horizons allows for the development of a strategy consistent with the transition to a low-carbon economy recognized in the Paris Agreement and UN Sustainable Development Goals. This information offers stakeholders greater confidence that we understand and have properly assessed potential climate-related impacts to our business. 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. This model was developed in conjunction with Villanova University and was performed for water and wastewater operations and, separately, gas operations. Villanova provided the facilitative guidance of an experienced and objective third-party.

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. 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.

Essential defines climate-related impacts though a model which weights likelihood, cost, magnitude of impact and time horizon. To perform qualitative scenario analyses, we implemented a multi-step scenario development process in which we identified potential risks and opportunities, key factors influencing those issues, driving forces, ranked them by importance and uncertainty, and created scenario matrices with narratives qualitatively analyzing the state of business and economic forces that would result in each set of circumstances. The scoring methodology developed applies to both risks and opportunities. Financial impacts could be from a single event or occurrence or derive from an annualized cost impact of a specified time. While cost is a quantitative assessment of impact, it was also important to qualitatively assess the magnitude of impact and degree of likelihood. Results were lists of risks and opportunities that were ranked and graded, the most significant of which are detailed within this report.

Determining Climate-Related Risks and Opportunities Through Scenario Analysis (continued)

This scenario analysis process is conducted as a rigorous workshop across several weeks, with additional internal meetings to prepare for each workshop session and to discuss various opinions and ideas. Multiple members of management with climate-related responsibilities partake in this process and the findings and conclusions are shared and discussed with company leadership. We look forward to continually revisiting and updating our analysis in future years.

Climate-Related Risks and Opportunities

Essential considers climate change risks across three time horizons, which correspond to common year markers for targets set by IPCC, governments, and private industry. We consider up to 2035 to be our short-term horizon and view this period as an actionable and pertinent range, as both physical and transitional risks are likely to adjust and shift in this time. As a state-regulated utility, this range aligns with our other business activities. We see 2035 through 2050 as a medium-term horizon for strategic capital and infrastructure planning, and from 2050 to 2080 years as our long-term time horizon. We believe that engaging in long-term planning cycles during which enterprise-wide issues are evaluated is important in addressing actions today, when outcomes pay dividends far into the future. As an organization focused on infrastructure renewal and advancement, we constantly strive to implement technologies that make our business practices more efficient for the customers we serve.

In assessing climate change risks and opportunities, we consider current and emerging regulations, legal proceedings and likelihood of litigation, technological advances, market influences, and the physical impacts of a changing climate, both acute and physical. We assess and manage risks through our enterprise risk management process, which identifies opportunities to build both in our operations and our business model. Essential regularly updates risk management policies, standards, and programs to align with global best practices and regulatory requirements, and we aim to anticipate emerging risks and opportunities. As a result of our assessment, we have identified the following risks and opportunities with the most significant potential to have a substantive financial or strategic impact on our business.

Climate-Related Risks and Opportunities

	Years	Risks	Opportunities
Short-term	**Through 2035**	• *Policy and regulation shifts (gas business unit):* Potential changes and uncertainty in regulatory environment	• *Potential for renewable natural gas adoption gas business unit):* RNG combines low or zero full-cycle carbon emissions with the high energy density and transportability of natural gas. • *Advanced leak detection (gas business unit):* By adopting advanced technologies, companies can minimize the risk of gas leaks and related incidents.
Medium-term	**2035-2050**	**Physical** • *Flooding: General flooding risk, sanitary sewer overflows, and dams (water and wastewater business unit):* Changing precipitation patterns, including increased intensity and frequency of extreme precipitation events, can put existing water and wastewater infrastructure at risk • *Water scarcity and business development (water and wastewater business unit):* Water permits and allocations, reduced aquifer levels, and mismatch of supply and demand • *Mandates on and regulations of existing services (water and wastewater business unit):* Challenges in water treatment to meet baseline of quality and reliability • *Implications of potential electrification (gas business unit):* Market or policy-driven shift away from natural gas usage • *Late entry for renewable adoption (gas business unit):* Financial risk of delayed adoption of new technologies	**Physical** • *Through master planning, integrate climate analyses into long-term capital budgeting (water and wastewater business unit):* Master planning is an opportunity for Essential to integrate the results of these climate analyses into the capital planning process undertaken by engineering teams to mitigate climate-related risks. • *System purchases due to increased water quality and quantity issues (Water and wastewater business unit):* Acquisitions of smaller water and wastewater systems that cannot manage increased complexity and costs of operations • *Potential for hydrogen blending (gas business unit):* Hydrogen is a potential alternative energy source that can be integrated into existing natural gas infrastructure.
Long-term	**2050-2080**	At this time, Essential has not identified any significant risks and opportunities that will materialize in the long-term time horizon. The company does anticipate that some of its identified risks and opportunities, however, could have significant impacts across multiple time horizons.	

CLIMATE RISKS

Flooding

(Medium-term; physical; water and wastewater business unit)

Sub-risks: General flooding risk, sanitary sewer overflows (SSOs), and dams

Changing precipitation patterns, including increased intensity and frequency of extreme precipitation events, can put existing water and wastewater infrastructure at risk in a variety of ways. Within the context of flooding, Essential has identified three sub-risks within the risk of flooding, including a general flooding risk, SSOs, and damage to dams. As a general flooding risk, there is risk to infrastructure planning because of the increased intensity and frequency of extreme precipitation events with a number of assets built below a 500-year floodplain. Heavy precipitation events are also a risk to operations as such events can force even a well-operated and maintained system to experience the occasional sanitary sewer overflow.

Water scarcity and business development

(Medium-term; physical; water and wastewater business unit)

Sub-risks: Water permits and allocations, reduced aquifer levels, and mismatch of supply and demand

Essential has identified three sub-risks impacting its business development. Changing precipitation patterns and water scarcity are a risk to operations because of potential water rights and permit allocations. Water scarcity also poses a risk to business development in Texas due as reduced aquifer levels, which creates challenges in meeting customer demand. This is coupled with the risk that current systems could be inadequate to meet future increased water demand resulting from the rise in temperatures, creating a mismatch of supply and demand.

Mandates on and regulations of existing services

(Medium-term; physical; water and wastewater business unit)

Sub-risks: Disinfection byproducts and contaminants of emerging concern

Rising temperatures create risk in operations because of increased water quality concerns including increased disinfection byproducts (DBP) and contaminants emerging concern. At the same time meeting treatment standards will become more complex as, for example, the costs of water testing increase and there is a need for new treatment methods. For example, chemical DBP, either organic or inorganic depending on the context, form as part of normal chemical disinfection treatment. In the case of our operations, the disinfectant most prone to cause DBP is chlorine, which is highly dependent on temperature. Through climate analysis, we determined the potential implications to our business operations under a low emissions scenario (SSP1-2.6) and a high emissions scenario (SSP5-8.5), both of which show rising temperatures in the future, leading to increase chlorine dosages and therefore increased prevalence of DBP. The rising temperatures identified in the climate analysis will also create an environment where blooms of toxin-producing cyanobacteria can proliferate. These organisms produce cyanotoxins, a contaminant of emerging concern, which we have identified as a potential climate-related risk to our ability to provide safe and healthy drinking water to our customers.

Policy and regulation shifts
(Short-term; transitional; gas business unit)

This risk relates to potential changes in policies and regulations affecting natural gas utilities. Uncertainty in regulatory environments can hinder investment in research and development and strategic planning. As a utility, the company has a long-term orientation and makes capital investments that often span generations. In a tumultuous political and regulatory environment, this business activity becomes more challenging. More stability in the nation's and region's energy future would promote sound capital investment decisions.

Implications of potential electrification
(Medium-term; transitional; 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.

Late entry for renewable adoption
(Medium-term; transitional; 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. 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.

CLIMATE OPPORTUNITIES

Through master planning, integrate climate analyses into long-term capital budgeting

(Medium-term; physical; water and wastewater business unit)

Master planning is an opportunity for Essential to integrate the results of these climate analyses into the capital planning process undertaken by engineering teams to mitigate climate-related risks. This opportunity relates to standardization of a process by which Essential would systematically incorporate detailed and technical future-state climate modeling into the master planning process. This would improve long-term resiliency and orient planning of assets around long-term climate implications and risk but require additional tools, expertise, and other resources.

Acquisitions of smaller water and wastewater systems that cannot manage increased complexity and costs of operations

(Medium-term; physical; 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 the impacts of climate change. As the climate changes, water and wastewater systems will become more complex to operate and require increased capital investment to meet change; this can include challenges such as more complex treatments being required to address emerging contaminants of concern or increased expertise and capital needed to meet the demands of increasingly complex emerging regulatory compliance. While these can present as risks our business, they also present opportunities for acquisition of smaller-scale systems. 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 prior 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.

Potential for hydrogen blending

(Medium; transitional; gas business unit)

Hydrogen is a potential alternative energy source that can be integrated into existing natural gas infrastructure. It offers opportunities for business evolution and sustainability. While it introduces additional safety and operational complexities, the benefits include aligning with green energy trends and attracting investment. The U.S. and international communities are exploring hydrogen as a clean energy source, with various initiatives promoting its development. The U.S. Department of Energy's Hydrogen Program and global initiatives like the European Green Deal support hydrogen's role in achieving decarbonization goals. This opportunity aligns with these broader trends, providing a pathway for Essential Utilities to contribute to the green transition.

Advanced leak detection
(Short-term; transitional; gas business unit)

Leak detection focuses on enhancing safety and reducing environmental risks. By adopting advanced technologies, companies can minimize the risk of gas leaks and related incidents. This opportunity requires a focus on enhancing safety protocols and regulatory compliance. Effective leak detection is crucial in the transition to cleaner energy. It aligns with regulatory requirements and environmental goals, helping to reduce greenhouse gas emissions and prevent catastrophic events. In the U.S., there is increasing emphasis on safety and compliance, with regulatory bodies requiring rigorous leak detection standards. This opportunity supports sustainability objectives while ensuring operational safety and regulatory compliance.

Potential for renewable natural gas adoption
(Short-term; transitional; 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.

GHG EMISSIONS REDUCTION EFFORTS, TARGETS AND METRICS

GHG Emissions Reduction Efforts and Climate Targets

In January of 2021, Essential announced a commitment to substantially reduce Scope 1 and 2 greenhouse gas emissions. By 2035, Essential will reduce its emissions by 60% from its 2019 baseline. This will be achieved by extensive gas pipeline replacement, renewable energy purchasing, accelerated methane leak detection and repair, and various other planned initiatives that are highly feasible with proven technology. This science-based commitment is consistent with the rate of reduction necessary through 2035 to keep on track with the Paris Agreement, which aims to limit the global temperature increase to well below 2 degrees Celsius. All our utilities- gas, water, and wastewater- across our multistate operating footprint, will be contributing to this enterprise-wide target and building on important work and progress in recent years. Our water and wastewater operations as well as our new gas operations will each be contributing about a 60% Scope 1 and 2 emissions reduction individually.

Transparency is at the center of our ESG program and a core value of our company, so we will report on our progress toward this goal until we meet the target. This is a strong first step toward an ultimate aspiration of net zero emissions, which we acknowledge will only be possible with further technological and engineering innovation. While we're optimistic and excited about the pace of technological advancement, this initial 60% Scope 1 and 2 emissions reduction comes from projects and initiatives we have already planned or put into place. They utilize existing and proven technology and methods and are real and tangible. Importantly and uncommonly in the utilities space, the baseline is very recent, 2019.

Almost all of Essential's Scope 1 emissions are emitted by our gas operations. Of this, the large majority of such emissions relate to fugitive methane from pipeline leaks. As natural gas, which is primarily methane, travels through our network of underground pipes on its way to the customer, a very small portion of this volume leaks out and escapes into the atmosphere, often due to corrosion leaks, material defects or excavation damages. Our Long-Term Infrastructure Improvement Plan seeks to, over time, systematically replace older and more vulnerable sections of pipe made of materials that are leak-prone. Additionally, as is common across our industry and consistent with regulations, we utilize various leak detection technologies to proactively identify sources of fugitive methane and repair leaks as quickly as possible.

Almost all of Essential's Scope 2 emissions are driven by our water and wastewater operations. The physics of moving vast amounts of water and wastewater through networks of pipes to and from Essential's plants requires extensive amounts of energy. Our total energy consumption in this area of our operations has been relatively consistent over the last three years with increases attributed to acquisitions and the organic growth of our business. In 2022, Essential began procuring nearly 100% renewable electric power for its water and wastewater utilities in Illinois, New Jersey, Ohio, and Pennsylvania. Essential has also contracted to source 25% of its electricity in Aqua Texas through an offsite solar power purchase agreement (PPA), which started in June 2020. These states feature deregulated energy markets which allow for this arrangement.

As a result of renewable procurement, greenhouse gas emissions for Essential's water and wastewater operations have been more than halved and, in combination with reductions in its gas operations, Essential has reduced its emissions by 25% from its 2019 baseline.

Materially all of Essential's Scope 3 emissions are driven by our gas operations. The large majority of this is carbon dioxide emitted by customers upon combustion of natural gas in their home or business. We continue to assess opportunities and initiatives to reduce these emissions, aware that Scope 3 emissions are more challenging to address directly than Scope 1 and 2 emissions, as is the case with other industries. Like most of our peer gas utilities, we are examining exciting opportunities for alternative fuels, such as renewable natural gas or hydrogen, which also serve to reduce Scope 3 emissions.

Essential's Greenhouse Gas Emissions Reduction Target*

	2019 Baseline Scope 1+2 Emissions (metric tons of CO_2e)	2035 Baseline Scope 1+2 Emissions (metric tons of CO_2e)	Emissions Reduction Commitment
Essential	**670,923**	**268,369**	**60.0%**
Gas Distribution	539,742	218,288	59.5%
Water and Wastewater	131,181	50,081	61.8%

*Essential has recalculated its 2019 Scope 1 and 2 baseline and associated 2035 target to account for a change in the methane emissions factor utilized for calculations consistent with the 100-year value provided by AR5 (IPCC Fifth Assessment Report). Essential's 60% Scope 1 and 2 emissions reduction commitment remains confidently in place.

CLIMATE METRICS

For the second consecutive year, Essential engaged a third party, Keramida, to conduct a limited assurance audit of Scope 1 and 2 greenhouse gas emissions in accordance with ISO 14064-3: 2019, which is an approved verification standard accepted by CDP. Keramida is a gold accredited service provider to CDP for verification services.

Essential Utilities

Greenhouse Gas Emissions (Metric Tons CO_2e)*

	2023	2022	2021	2020	BASELINE 2019
Scope 1 emissions (metric tons CO_2e)	463,065	489,132	514,787	531,219	553,530
Scope 2 emissions (market-based; metric tons CO_2e)	41,392	51,008	117,723	111,262	117,393
Total Scope 1 and 2 emissions (metric tons CO_2e)	**504,457**	**540,141**	**632,510**	**642,481**	**670,923**
Total Scope 3 emissions	8,194,886	9,020,390	8,659,222	8,653,185	Not disclosed

*2019 was the first year for which Essential disclosed Scope 1 and 2 GHG emissions for its combined water, wastewater, and natural gas utilities. This served as the baseline for the company's emissions reduction target. 2020 is the first year for which Essential disclosed Scope 3 emissions for its combined water, wastewater and gas utilities. Essential has rebaselined and adjusted all historical years to account for a change in the methane emissions factor utilized for calculations consistent with the 100-year value provided by AR5 (IPCC Fifth Assessment Report). Also, Essential revised 2022's GHG inventory to correct a small methodological inconsistency with prior years.

Gas Operations

Greenhouse Gas Emissions (Metric Tons CO_2e)*

	2023	2022	2021	2020	2019
Scope 1 emissions (metric tons CO_2e)	446,929	472,807	498,793	515,068	537,473
Scope 2 emissions (market-based; metric tons CO_2e)	3,812	5,198	4,502	3,156	2,269
Total Scope 1 and 2 emissions (metric tons CO_2e)	**450,741**	**478,006**	**503,295**	**518,224**	**539,742**
Total Scope 3 emissions	8,070,212	8,911,091	8,534,266	8,533,042	Not disclosed

*Essential chooses to present Scope 2 emissions using the market-based method, as this approach incorporates the impact of various sourcing decisions, such as its procurement of renewable energy. In contrast, the location-based method reflects the average emissions intensity of electric grids on which energy consumption occurs. Essential's gas operations' location-based Scope 2 emissions (measured in metric tons CO2e) are as follows: 4,172 (2023) 4,576 (2022), and 4,332 (2021). This figure and the value of Scope 3 emissions were not calculated in 2019. Essential has rebaselined and adjusted all historical years to account for a change in the methane emissions factor utilized for calculations consistent with the 100-year value provided by AR5 (IPCC Fifth Assessment Report). Also, Essential revised 2022's GHG inventory to correct a small methodological inconsistency with prior years

Breakdown of Material Scope 3 Emissions

Downstream Scope 3 emissions represent the only significant and material source for Essential's gas operations. This total, 8,070,212 metric tons CO_2e, is produced from customer combustion of natural gas delivered by the company.

Water and Wastewater Operations

Greenhouse Gas Emissions (Metric Tons CO_2e)*

	2023	2022	2021	2020	2019
Scope 1 emissions (metric tons CO_2e)	16,136	16,324	15,994	16,151	16,057
Scope 2 emissions (market-based; metric tons CO_2e)	37,580	45,810	113,221	108,106	115,124
Total Scope 1 and 2 emissions (metric tons CO_2e)	**53,716**	**62,134**	**129,215**	**124,257**	**131,181**
Total Scope 3 emissions	124,674	109,299	124,956	120,143	110,675

*Essential chooses to present Scope 2 emissions using the market-based method, as this approach incorporates the impact of various sourcing decisions, such as its procurement of renewable energy. In contrast, the location-based method reflects the average emissions intensity of electric grids on which energy consumption occurs. Essential's water and wastewater operations' location-based Scope 2 emissions (measured in metric tons CO2e) are as follows: 114,408 (2023), 121,190 (2022), and 124,596 (2021).

Breakdown of Scope 3 Emissions

	Metric Tons CO_2e	Percentage of Total
Purchased goods and services	30,810	24.7%
Capital goods	59,070	47.4%
Fuel-and-energy-related activities	26,916	21.6%
Other (upstream)	5,448	4.4%
Employee commuting	1,682	1.3%
Waste generated in operations	747	0.6%
Total Scope 3 emissions	**124,674**	**100%**

Forward-Looking Statements

This report contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, which generally include words such as "believes," "expects," "intends," "anticipates," "estimates" and similar expressions. The company can give no assurance that any actual or future results or events discussed in these statements will be achieved. Any forward-looking statements represent its views only as of today and should not be relied upon as representing its views as of any subsequent date. Readers are cautioned that such forward-looking statements are subject to a variety of risks and uncertainties that could cause the company's actual results to differ materially from the statements contained in this report. Such forward-looking statements include, but are not limited to, statements relating to the capital to be invested by the water, wastewater, and gas distribution divisions of the company. There are important factors that could cause actual results to differ materially from those expressed or implied by such forward-looking statements including the factors discussed in our Annual Report on Form 10-K and our Quarterly Reports on Form 10-Q, which is filed with the Securities and Exchange Commission. For more information regarding risks and uncertainties associated with the company's business, please refer to the company's annual, quarterly and other SEC filings. The company is not under any obligation — and expressly disclaims any such obligation — to update or alter its forward-looking statements whether as a result of new information, future events or otherwise.

762 W Lancaster Avenue
Bryn Mawr, PA 19010
ESG@essential.co
essential.co