Republic Services, Inc. - Climate Change 2022

C0. Introduction

C0.1

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

Unless the context requires otherwise, all references in this CDP response to Republic, the Company, we, us and our refer to Republic Services, Inc. and its consolidated subsidiaries. Republic is one of the largest providers of environmental services in the United States, as measured by revenue. As of December 31, 2021, we operated facilities in 41 states through 356 collection operations, 239 transfer stations, 198 active landfills, 71 recycling processing centers, 3 treatment, recovery and disposal facilities, 3 treatment, storage and disposal facilities (TSDF), 6 salt water disposal wells, and 7 deep injection wells. We are engaged in 77 landfill gas-to-energy and other renewable energy projects and had post-closure responsibility for 124 closed landfills. In 2021, our total Scope 1, 2 and 3 emissions were 17,436,116 metric tonnes of CO2e. Of that amount, landfill emissions contributed 68%, our fleet contributed 8% and Scope 3 emissions were 20%. Our Scope 1 and 2 emissions, include landfill methane emissions, vehicle and equipment emissions, and building electricity emissions. We have adopted an aggressive target for reducing these operational GHG emissions, approved by the Science Based Targets initiative (SBTi). Our goal is to reduce absolute Scope 1 and 2 greenhouse gas emissions 35% by 2030 (2017 baseline year), which aligns with the United Nations “Climate Action” Sustainable Development Goal, 13.2 — reduce greenhouse gas emissions. While our Scope 3 emissions are not included in our SBTi-approved goal, we monitor and publicly report on them.

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 2021	December 31 2021	No	<Not Applicable>

C0.3

(C0.3) Select the countries/areas in which you operate.

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.

Operational control

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, a Ticker symbol	NYSE: RSG

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	Given the importance of corporate sustainability to our stakeholders, Republic created a dedicated Sustainability and Corporate Responsibility Committee (SCR) of the board in 2015. Of the 12 members of our Board, 5 sit on the SCR committee, all of whom are independent board members. The SCR has responsibility for climate-related issues. From the Committee Charter: "The Committee is appointed by the Board of Directors (the "Board") to assist the Board in fulfilling its oversight responsibility and to act in an advisory capacity to the Company's management with respect to significant issues, strategies, goals, objectives, policies and practices that pertain to (1) Republic's sustainability performance including sustainability innovation; (2) Republic's corporate responsibilities that are of significance to the Company and its role as a socially responsible organization; and (3) risks and opportunities of the Company, including climate change, safety, environmental and reputational risks and opportunities, facing the Company and the practices by which these risks are managed and mitigated. The Committee also shall perform such other duties and responsibilities as may be delegated to it from time to time by the Board." One of the Board's decision- making responsibilities that directly impacts the Company's climate-related activities is the approval of our annual budget, which allocates funding for the Company's sustainability-related agenda. This includes activities such as landfill gas to energy projects, fleet electrification, recycling infrastructure, etc.

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	Scope of board-level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	Our Board is actively involved in risk oversight, and we believe that Republic's environmental and sustainability initiatives require a dedicated committee due to the unique nature of these risks, which includes the time frame in which some of these risks will play out, the difficulty in quantifying the impact of these risks, the interconnected aspects of these risks and the challenges associated with managing uncertainty. The Sustainability and Corporate Responsibility Committee held four meetings and met regularly in executive sessions during 2021. The annual Committee calendar starts in the first quarter, meeting to review management of and progress on environmental topics, including climate related issues. In the second quarter, the results of the Enterprise Risk Management process are reviewed by the Committee. This review includes assessment, prioritization and management of risks and opportunities throughout the business, including climate-related issues. Business continuity and crisis preparedness are also discussed in this meeting, which includes severe weather, fires, and other physical impacts of climate change. At the end of the second quarter, the Committee participates in the annual sustainability reporting activities. In the third quarter, the Committee considers management and progress on social topics, such as recycling education. The calendar then culminates in the fourth quarter with the sustainability strategy and review of sustainability reporting and progress against sustainability goals, which tie together and are in response to the previous three discussions/meetings. The sustainability strategy includes our approved Science Based Target initiative Scope 1 and 2 greenhouse gas reduction goal. We also have announced goals around increasing biogas capture for beneficial reuse by 50% from 2017 and to increase the recovery of key materials by 40% from 2017 by the year 2030. Both of these goals positively impact our impact on GHG emissions. The company's sustainability program is considered a business development opportunity and sits under the Chief Development Officer's team. This review supports and feeds the broader Company strategy. Projected initiative benefits are incorporated into budgets and pro formas that underpin Management's long-term compensation performance metrics, which are reviewed by the entire Board during the same time frame.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	Republic's Board currently consists of 12 directors, and we believe that each of our director nominees is highly qualified and collectively, they represent an ideal mix of experience, wisdom, integrity, and ability to advance Republic's strategy and serve the interests of all our stakeholders. When assessing skill, the Board evaluates attributes such as relevant business, industry experience, and education. We report on the skills distribution of our Board members in our Proxy, which states that 8 of our 12 Board members possess ESG skills.	<Not Applicable>	<Not Applicable>

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)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify (EVP, Chief Development Officer)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly

C1.2a

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

The Executive Vice President, Chief Development Officer (EVP/CDO) has responsibility for Republic's sustainability programs, which include climate related issues. The EVP/CDO is on the executive leadership team, along with the CFO, COO, CMO, CCO, CDO, CHRO, and CLO (names and full titles can be found at: https://investor.republicservices.com/corporate-governance/management), reporting to the CEO. In addition, the EVP/CDO reports to and supports the Sustainability & Corporate Responsibility Committee of the Board of Directors on sustainability topics on a quarterly basis. Sustainability and climate-related issues are assigned to the EVP/CDO because this role has responsibility for the sustainability organization, is a member of the Enterprise Risk Management Council, as well as, the ability and broader charter to manage unique and/or emerging opportunities and innovation. The EVP/CDO has a team reporting to him that is responsible for the sustainability program, including:

· Annual enterprise-wide greenhouse gas inventory
· Annual sustainability reporting including the GRI report, SASB report, TCFD Report, etc.
· Annual survey responses including DJSI, CDP, and various ESG ratings surveys
· Climate change risk and opportunity assessment
· Stakeholder engagement and materiality assessment
· Membership on the enterprise risk management team.

In addition, this team implements corporate sustainability initiatives, including the corporate-wide recycling program and organics diversion program. It also provides cross-functional support to others in the organization who manage assets impacted by, or deliver services related to, climate change. These functions include Operations, Engineering, Fleet Management, Supply Chain/Procurement, National Accounts, Communications, Public Policy, Investor Relations, and others. The EVP/CDO is also responsible for government affairs, growth initiatives, mergers and acquisitions, innovation and technology development. The sustainability team, under the guidance of the EVP/CDO, identifies and monitors climate related issues through an internal/external stakeholder engagement process, known as a materiality assessment which is conducted periodically, and the following annual activities that occur throughout the year:

· Scope 1, 2 and 3 (business travel, subcontractor and third-party hauling) greenhouse gas (GHG) inventory (which is verified by an external body)
· Scope 3 Environmentally extended input-output (EEIO) GHG risk assessment;
· STEEP/megatrends analysis
· Various climate-related vulnerability assessments, including physical and transition risks
· Attendance at industry conferences, training and webinars to stay current on climate science
· Benchmarking to peers, sustainability leaders, and various sustainability ranking surveys/questionnaires
· Independent members of our Board and members of our management team engaged with shareholders representing approximately 52% of our investment base in 2021.

These tools provide data and insights as to potential climate related issues. The baseline was formed in 2014 during the development of the current sustainability program. The top climate related issues identified at that time, as shown in our materiality matrix, were landfill GHG emissions (risk), fleet GHG emissions (risk), and the ability of recycling to reduce our customer's GHG footprint (opportunity). Following the 2018 update of our materiality assessment, in 2019 we launched our Science Based Target initiative approved greenhouse gas reduction goal. We also manage severe weather impacts using the above tools to scan for updates, goal context, and emerging risks and opportunities.

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	

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
Corporate executive team	Monetary reward	Emissions reduction project Energy reduction project Efficiency project	We've linked executive compensation with progress toward our Safety, Talent and Climate Leadership goals. Achievement of the senior executives' (CEO and named executive officers (NEOs)) financial metrics (EPS, FCF, etc.) and associated incentives are based upon underlying three-year plans and associated budgets, which incorporate the benefits from our strategic initiatives and sustainability efforts (including various projects related to climate change and other factors). The projects and metrics directly linked to management of climate change issues or impacts include landfill gas collection efficiency and beneficial reuse projects, recycling efficiency, fleet productivity and conversion to clean fuel trucks.
Management group	Monetary reward	Emissions reduction project Energy reduction project Efficiency project	The annual Management Incentive Plan (MIP), provides incentives for meeting certain targets and metrics related to climate change and other factors. The projects and metrics directly linked to management of climate change issues or impacts include, landfill gas collection efficiency and beneficial reuse projects, recycling efficiency, fleet productivity and conversion to clean fuel trucks.

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	This aligns with broader operational, financial and strategic planning timeframes.
Medium-term	5	10	This timeframe aligns with capital decisions for fleet assets, which have roughly a 10-year lifetime.
Long-term	10	40	This timeframe aligns with larger infrastructure capital decisions. For example, recycling facilities are 20-30 year assets and we plan for and monitor landfill airspace for 40+ years (as much as 100 years for some sites).

C2.1b

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

Criteria used to determine what constitutes substantive financial and strategic business impacts were developed by our enterprise risk management (ERM) team with the guidance and approval of the Board and executive management. These criteria are applicable to climate risks and other corporate wide risks. The quantifiable indicators of substantive financial impact include lost operating income, which may include a loss of revenue or increase in costs above certain dollar amounts. Quantifiable indicators of substantive strategic impact may include substantial fines or suspension of operations due to legal, regulatory or compliance matters; operational challenges that result in major impacts on customer experience in multiple regions or major disruption to routine products/services; or brand/reputational impacts which result in significant national media coverage/extended image problem. Any of these impacts alone or in combination may elevate a topic to the level of being considered substantive. For example, each risk is scored by impact, resulting in a negligible, minor, moderate, major or catastrophic risk categorization. The likelihood and probability are then estimated, and the risks are plotted into a matrix that facilitates discussions about risk management. For the purposes of assessing climate-related risks, these analyses may consider financial impacts at or above $1M.

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
Upstream
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
Our Enterprise Risk Management (ERM) process is designed to identify, assess, prioritize, assign risk owners, respond to and monitor risks and opportunities across the business. It is a formalized framework that is embedded into and fed by our current processes, which creates greater insight and durability. The ERM register is populated with risks and opportunities that have been identified by the following business functions and processes: • Budget reviews • Business impact analysis • Area operating reviews (AORs) • Quarterly management operating reviews (QMORs) • Management representation process • Individual functions • Management Interviews The local and operating review processes tend to focus on short term risks, within a 0- 5-year timeframe. However, when discussing long-lived assets such as a recycling facilities or landfills, medium and long-term issues may arise. The Corporate planning functions for fleet, recycling facilities, and landfills align with the timeframes discussed above in C2.1a and can range from short-term (0-5 years), to medium term (5-10 years) to long term (10-40 years). These processes are conducted at the broad business level and at the asset level, as applicable. For example, we conducted a vulnerability assessment of our water risk at the company-wide level. Based on the results, we were then able to drill down into areas of concern to assess individual assets and their unique risk profiles. At the local or asset level, local business leaders assess current and potential assets, competitive threats, strengths and weaknesses, risks and opportunities, growth plans, market dynamics and pricing, regulatory and legislative changes, and other key local market factors. Executive management, representing both Corporate and Field (asset) operations, meets on a quarterly basis, or more often, and discusses market trends and drivers, the business climate, innovation, risks and opportunities, regulatory and legislative changes, and other factors that influence our business strategy. As shown above, various individual functions provide risks and opportunities to the ERM Team. Sustainability is one of these functions and has a stand-alone process for identifying risks and opportunities related to environmental, social and governance topics. This process is unique in that it recognizes short-term, which aligns with a 5-year outlook; medium term, which overlaps the 5-year outlook and spans 2020-2030; and long term, which runs to 2050 and beyond; risks and seeks to quantify non-financial risks to help the ERM Team and the broader business understand sustainability risks in the context of the business strategy. Once the risks are identified, they are fed into the ERM risk register to enable quantifying and prioritizing these risks using the same methods/criteria as other business risks. Risks identified through both the business processes and the sustainability function include those that are directly linked to climate change, such as fuel and electricity consumption, our recycling and composting business, emissions from our fleet, emissions from our landfills and impacts of adverse weather. Aggregated risks and opportunities are then assessed and prioritized based on their impact to the strategy/organization by the ERM Team, which consists of the following functional representatives: • Engineering & Environmental Compliance • Sustainability • Internal Audit • Operations Support • Finance Support • Safety • Information Security • Human Resources • Business Development • Legal The ERM team uses an online evaluation system and periodic meetings to conduct ongoing risk assessment. Assessment includes ranking of the likelihood that a risk will occur and ranking of the impact on the operating segment should the risk occur. Evaluation categories for both impact and likelihood are described and quantified to ensure that each team member is using the same criteria and meaning for the various categories (normalization of responses). Risk impact categories include negligible, minor, moderate, major and catastrophic. Within these categories, risks are evaluated for quantitative (financial and legal/regulatory/compliance) impact and/or qualitative (operational and brand/reputation) impact. In this way, both financial and strategic impacts and opportunities are assessed. Risk likelihood options include very low, low, moderate, high and very high. The likelihood and impact scores are then aggregated and the risks are plotted into the risk matrix. The risk matrix is then evaluated by the ERM team, reported to our ERM Council, comprised of executive officers, and further reported to the Board of Directors in the annual ERM update. As an example of how this process was applied to our operations, we have identified the regions and situations where climate related events that could present disruption to our business. Once adverse weather appears in the risk register, it is provided to the ERM team via the online system as one of many potential risks or opportunities to be evaluated. For example, the business sees the impact of storms and associated flooding in the day-to-day operations, as well as, in the planning of infrastructure that may span 10, 20 or more years. The individual members of the ERM team assess the impacts of adverse weather for impact and likelihood. The impacts from adverse weather have the potential to last several months and or to affect several facilities. Therefore, adverse weather would be considered to have the potential for substantive impact. We have developed a business continuity plan and adopted it into our operations to mitigate the impacts of severe weather and reduce down time in our operations. This has resulted in only minor delays in service and extremely minimal impacts to our assets and employees despite the occurrence of extreme weather events.

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	Our facilities and operations are subject to a variety of federal, state and local requirements that regulate, among other things, the environment, public health, safety, zoning and land use. Operating and other permits, licenses and other approvals generally are required for landfills and transfer stations, recycling facilities, composting facilities, certain solid waste collection vehicles, fuel storage tanks and other equipment and facilities that we own or operate. These permits are subject to denial, revocation, modification, and renewal in certain circumstances. These laws and regulations provide governmental authorities with strict powers of enforcement, which include the ability to revoke or decline to renew any of our operating permits, obtain injunctions, or impose fines or penalties in the event of violations, including criminal penalties. Examples of specific regulations considered in our climate-related risk assessment are the EPA and the NHTSA regulations applicable to heavy-duty vehicles limiting greenhouse gas emissions and increasing fuel economy standards, as well as, the renewable fuel standards that the EPA sets annually, which affect the type of fuel our motor vehicle fleet uses.
Emerging regulation	Relevant, always included	Efforts to curtail the emission of greenhouse gases and to ameliorate the effects of climate change continue to progress. Our landfill operations emit anthropogenic methane, identified as a greenhouse gas, and our vehicle fleet emits, among other things, carbon dioxide, which also is a greenhouse gas. While passage of comprehensive, federal climate change legislation appears unlikely in the near term, we expect any such legislation, if enacted, to impose costs on our operations, which could be material. With regard to greenhouse gas emissions from our landfills, on July 14, 2016, the EPA issued amendments to its regulations that require large landfills that commenced construction, reconstruction or modification on or after July 17, 2014, to capture additional landfill gas to reduce emissions of methane and certain non-methane gases, which are recognized as greenhouse gases. In a separate action finalized that same day, the EPA issued updates to its 1996 Emission Guidelines to reduce emissions of landfill gas from existing active landfills. As part of the Biden Administration focus on climate change, the EPA has taken further steps to implement these regulations. These regulations, or an amended version of them that eventually goes into effect, may require our landfills to deploy more stringent emission controls and monitoring systems, with resulting capital or operating costs. The application of these or other greenhouse gas regulations to our landfills could have a material adverse effect on our landfill operations and on our consolidated financial condition, results of operations and cash flows. Each state in which we operate has its own laws and regulations governing solid waste disposal, water and air pollution, and, in most cases, releases and cleanup of hazardous substances and liabilities for such matters. States also have adopted regulations governing the design, operation, maintenance and closure of landfills and transfer stations. Some counties, municipalities and other local governments have adopted similar laws and regulations. In addition, our operations may be affected by the trend in many states toward requiring solid waste reduction and recycling programs. These regulations may present new opportunities to offer sustainable environmental services to our customers but may require investment of time, effort and money to be able to offer these new solutions.
Technology	Relevant, always included	Our strategy includes an increasing dependence on technology in our operations; if any of our key technology fails, our business could be adversely affected. Our information technology systems are critical to our ability to drive profitable growth through differentiation, continue the implementation of standardized processes and deliver a consistent customer experience. One of our three differentiating capabilities is to enable our customers to do business with us through more channels and with better access to information and, accordingly, we have made substantial investment in our e-commerce platform. Problems with the operation of the information or communication technology systems we use could adversely affect, or temporarily disable, all or a portion of our operations. Inabilities and delays in implementing new systems can also affect our ability to realize projected or expected revenue or cost savings. Further, any systems failures could impede our ability to timely collect and report financial results in accordance with applicable laws. In addition, emerging technologies that are used to recycle and process waste, as an alternative to disposal of waste in landfills, represent risks, as well as opportunities, to our current business model. The relevance and associated risks of waste diversion technologies are discussed in the “market” topic below. As a part of our climate-related risk assessments, for example, Republic evaluates and assesses the risk of multiple landfill diversion strategies including waste to energy technologies, anaerobic digestion, landfill gas to energy, gasification, mechanical and chemical recycling of plastics, etc.
Legal	Relevant, always included	Republic’s ability to comply with existing and future legal and regulatory requirements is included in the scope of our climate-related risk assessments. For example, several states have enacted laws that require counties or municipalities to adopt comprehensive plans to reduce, through solid waste planning, composting, recycling or other programs, the volume of solid waste deposited in landfills. Additionally, laws and regulations restricting the disposal of certain waste in solid waste landfills, including yard waste, food waste, newspapers, beverage containers, unshredded tires, lead-acid batteries, electronic wastes and household appliances, have been adopted in several states and are being considered in others. Some jurisdictions have enacted or are considering enacting “extended producer responsibility” regulations, which are designed to obligate producers to fund the post-use life cycle of their products by providing recycling programs for their products. State and municipal governments may also enact “organic diversion” regulations that require food waste to be managed separately from the other waste streams, similar to the rules recently enacted in California. Several states have also enacted or are considering “minimum recycled content” regulations mandating certain minimum post-consumer recycled content in certain types of packaging, including California. Legislative and regulatory measures to mandate or encourage waste reduction and recycling also have been considered, or are under consideration by, the U.S. Congress and the EPA. These regulations may present new opportunities to offer sustainable environmental services to our customers but may require investment of time, effort and money to be able to offer these new solutions and expose us to additional regulatory requirements and competition from others offering these services.
Market	Relevant, always included	Most of the states in which we operate landfills require counties and municipalities to formulate comprehensive plans to reduce the volume of solid waste deposited in landfills through waste planning, composting, recycling or other programs. Some state and local governments mandate waste reduction at the source and prohibit the disposal of certain types of wastes, such as yard waste, at landfills. Further, many of our customers voluntarily are diverting waste to alternatives to landfill disposal, such as recycling and composting, while also working to reduce the amount of waste they generate. Many of the largest companies in the U.S. are setting zero-waste goals in which they strive to send no waste to landfills and some jurisdictions have enacted or are considering waste reduction regulations such as extended producer responsibility, organic diversion and minimum recycled content regulations. Although such actions help to protect our environment and reduce the impact of waste on climate change, they have reduced, and will in the future reduce, the volume of waste going to landfills and may affect the prices that we can charge for landfill disposal. Accordingly, we cannot assure you that we will be able to operate our landfills at their current volumes or charge current prices for landfill disposal services due to possible decreases in demand for such services. If we cannot expand our service offerings and grow lines of business to service waste streams that do not go to landfills and to provide services for customers that wish to reduce waste entirely, this could have a negative effect on our consolidated financial condition, results of operations and cash flows. Further, even if we can develop such service offerings and lines of business, disposal alternatives nonetheless could have a negative effect on our consolidated financial condition, results of operations and cash flows.
Reputation	Relevant, always included	Permits often take years to obtain as a result of numerous hearings and compliance requirements with regard to zoning, environmental and other regulations. These permits are also often subject to resistance from citizen or other groups and other political pressures. Local communities and citizen groups, adjacent landowners, governmental agencies and others may oppose the issuance of a permit or approval we may need, allege violations of the permits under which we currently operate or laws or regulations to which we are subject, or seek to impose liability on us for environmental damage. These risks related to our reputation which may limit our ability to do business are included in our climate-related risk assessments. Responding to these challenges has at times increased our costs and extended the time associated with establishing new landfills and transfer stations and expanding existing landfills. In addition, failure to receive regulatory and zoning approval may prohibit us from establishing new landfills or transfer stations or expanding existing landfills. Our failure to obtain the required permits to operate our landfills and transfer stations could have a material adverse effect on our consolidated financial condition, results of operations and cash flows. As an example of our actions in the event of opposition to our obtaining a permit, improved technical information as a project progresses, or changes in the anticipated economics associated with a project, we may decide to reduce the scope of, or abandon a project, which could result in an asset impairment. Our reputation and follow-through at other sites and in other communities provides a reference point to constituents of these challenging projects.
Acute physical	Relevant, always included	Our operations could be adversely impacted by extreme weather events, changing weather patterns, and rising mean temperature and sea levels, some of which we are already experiencing. For example, we have operations in multiple states that are affected by hurricanes and we have seen the impact of storms and associated flooding in our day-to-day operations and our infrastructure. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5° to 10° Fahrenheit over the next century. Changing weather patterns and rising temperatures are expected to result in more severe heat waves, fires, storms, and other extreme weather events. Any of these factors could increase the volume of material collected or processed under our existing contracts (without corresponding compensation), impede our employees' and equipment's ability to operate, disrupt our supply chain, delay the development of landfill capacity, or reduce the volume of material generated by our customers. In addition, adverse weather conditions may result in the temporary suspension of our operations, which can significantly affect our operating results in the affected regions during those periods. For example, in 2021 Republic’s markets were affected by the Texas Winter Freeze, Oregon Wildfires, Hurricane Elsa (Eastern US), Tropical Storm Fred (Southern US), Hurricane Ida (Southern US), Hurricane Nicholas (TX/LA), and the Heartland Tornado Outbreak (KY). Fortunately, due to our storm preparedness plans, we are able to protect employees and assets and typically were operational within 24 hours of each storm/event. Republic incorporates both acute and chronic physical climate-related risks into its climate-related risk assessments by evaluating our portfolio of operations against current and future climate scenarios to understand how it may be impacted by changes to both acute and chronic physical risks.
Chronic physical	Relevant, always included	The above described “acute physical” risks such as inclement or severe weather can become chronic when they occur year over year. The nature of the risks to the business are no different, what is different is the degree to which they occur and our corresponding response. Republic incorporates both acute and chronic physical climate-related risks into its climate-related risk assessments by evaluating our portfolio of operations against current and future climate scenarios to understand how it may be impacted by changes to both acute and chronic physical risks. For example, although hurricanes are listed above as an example of an acute risk, the data show that they may soon transition to a chronic risk. According to the National Hurricane Center, the 2021 Atlantic hurricane season was the third-most active hurricane season on record and sixth consecutive year with above average tropical cyclone activity. With a damage total of more than $80 billion, it was the third-costliest season on record. This indicates that businesses in the affected areas may soon need to consider hurricanes an annual event and plan accordingly.

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

Current regulation	Mandates on and regulation of existing products and services

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Based on an industry trade publication, we operate the fifth largest vocational fleet in the United States and in 2021 our fuel costs were $383.0 million. While our fuel costs increased due to an increase in fuel prices and service levels, a substantial rise or drop in fuel costs, including our ability to manage increases in fuel and energy related taxes or regulations, could materially affect our revenue and cost of operations. Increases in the cost of fuel or petrochemicals would increase our operating expenses, and we cannot assure you that we would be able to recover such cost increases from our customers. We depend on fuel purchased in the open market to operate our collection and transfer trucks and other equipment used for collection, transfer and disposal. Regulatory monitoring is taking place to ensure our existing and planned fleet programs and assets comply with current and future fuel and fleet regulations. The renewable fuel standards that the US EPA sets annually affect the type of fuel our motor vehicle fleet uses. Pursuant to the Energy Independence and Security Act of 2007, the EPA establishes annual renewable fuel volume requirements for four different categories of renewable fuels (renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel). These volume requirements set standards for the proportion of refiners' or importers' total fuel volume that must contain renewable fuels (as designated by regulation). Additionally, in California, the Advanced Clean Fleets (ACF) rule will require a percentage of vehicles in fleets to be EV at an increasing rate over the next 20 years. Refuse trucks are considered Group 2. These regulations are one of many factors that may affect the cost of the fuel we use.

Time horizon
Short-term

Likelihood
Very 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)
<Not Applicable>

Potential financial impact figure – minimum (currency)
26000000

Potential financial impact figure – maximum (currency)
71950000

Explanation of financial impact figure
Our fuel costs were $383.0 million in 2021, or 3.4% of revenue. A substantial rise or drop in fuel costs, including our ability to manage increases in fuel and energy-related taxes or regulations, could materially affect our revenue and cost of operations. For example, at current diesel consumption levels of 130M gallons, a twenty-cent per gallon change in the price of diesel fuel changes our fuel costs by approximately $26 million on an annual basis. By implementing a fuel recovery fee, we could recover this cost, which would offset our cost of $26 million. We also assessed what the impact to our operations would be in the event that a carbon tax of $63 per ton is implemented utilizing the Sustainable Development Scenario (SDS). We chose to use a carbon tax as an example of a regulatory device that could impact our business because it is a very specific type of policy lever that is readily modeled using scenarios to determine financial impact and demonstrate the resilience of our strategy. The estimated fleet fuel emissions cost impact is based on numerous assumptions and estimates, is subject to numerous uncertainties, and does not necessarily reflect or predict the actual impact on the Company's fleet fuel emissions costs in the years shown. For more information on the impact a carbon tax would have on our operations and the ways we are seeking to mitigate its impact please see our TCFD response at: https://www.republicservices.com/cms/documents/sustainability_reports/2021-Republic-Services-TCFD-Report.pdf

Cost of response to risk
2000000

Description of response and explanation of cost calculation
Fuel costs represent a significant operating expense. When economically practical, we may enter new fuel hedges, renew contracts, or engage in other strategies to mitigate market risk. As of December 31, 2021, we had no fuel hedges in place. While we charge fuel recovery fees to a majority of our customers, we are unable to charge such fees to all customers. We have long been a leader in alternative fuel vehicles, beginning with natural gas vehicles until electric vehicles are commercially viable. Natural gas vehicles produce far fewer carbon emissions than their diesel counterparts and with the use of renewable natural gas (RNG) these vehicles are even more environmentally responsible. We have used RNG to fuel 100% of the natural gas vehicles in our collection fleet since 2020. The process of transitioning to an electric fleet, with RNG as a bridge fuel, further insulates us from fossil fuel price volatility. With one of the largest vocational fleets in the country, using innovative technology to reduce emissions is vital. Today, approximately 21% of our fleet operates on natural gas. In 2021, approximately 13% of our replacement vehicle purchases were CNG vehicles, bringing the number of vehicles running on alternative fuels to more than 3,300. Using alternative fuel vehicles provides us a competitive advantage in communities with strict clean emission initiatives that focus on protecting the environment. Although upfront capital costs are higher, using alternative fuels reduces our overall fleet operating costs through lower fuel expenses. Cost of response: The cost of management figure is based on the cost to administer fuel recovery fees, the cost of hedges and the cost of converting to CNG. For 2021, the net operating cost impact was negative given the positive operating return on converting to CNG combined with the CNG tax credits. Incremental capital cost for a representative 10-year project of 100 vehicles requiring 1 fueling station is roughly $2M (this project has a positive ROI).

Comment

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Cyclone, hurricane, typhoon

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Our operations could be adversely impacted by extended periods of inclement weather, or by increased severity of weather resulting from climate change, some of which we likely are already experiencing. In 2021 we experienced significant impacts from 7 major climate events (1 fire, 1 winter storm, 1 tornado, 4 tropical storms/hurricanes). Recent studies suggest that global warming is occurring faster than previously projected, with the US EPA projecting a 3° to 12° Fahrenheit temperature increase in the United States by the end of the century. In addition to sea level rise, this temperature increase is expected to result in more severe droughts, floods, and other extreme weather events. Any of these factors could increase the volume of waste collected under our existing contracts (without corresponding compensation); interfere with collection, transfer station and landfill operations, delay the development of landfill capacity; or reduce the volume of waste generated by our customers. In addition, adverse weather conditions may result in the temporary suspension of our operations, which can affect our operating results in the affected regions during those periods. Notably, while weather events such as hurricanes may increase the amount of material that is sent to our landfills, they could negatively impact the quality of recycling materials, making those materials unsalvageable and therefore decreasing profitability.

Time horizon
Short-term

Likelihood
Very 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)
<Not Applicable>

Potential financial impact figure – minimum (currency)
529343

Potential financial impact figure – maximum (currency)
2464364

Explanation of financial impact figure
We calculated the minimum financial impact figure by taking an average of tons of commodities sold per month across various facilities in 2021 (2.2 million tons/year across 71 facilities averages more than 2,500 tons/month at one facility) multiplied by the average sale of materials (SOM) value for 2021 ($205/ton used for this analysis). This results in an average loss for one month of downtime at an average sized facility ($529,343) caused by a weather event at an average size facility. The financial impact would be greater from multiple months of downtime at average size facilities or closures at larger facilities, which can produce 12,000 tons per month. The financial loss from a one month closure of one of these larger facilities is $2,464,364. As a historic example, we had to shut down a large recycling facility in New Orleans for 1 month after Hurricane Katrina, which resulted in close to $1M in lost recycling revenue.

Cost of response to risk
2500000

Description of response and explanation of cost calculation
Management action case study: Republic actively and annually reviews physical risks to its business as part of an annual risk management assessment process. As we identify and prioritize critical risks to our physical assets, we implement the changes or management programs, where necessary, to mitigate the impacts. We have put in place and continue to update an Emergency Preparedness and Disaster Recovery Plan for Field Staff and perform local level training on an on-going basis. The Area President (AP), or designee, owns this plan and its implementation for their respective region. The Plan not only prepares Republic for impact to our assets and operations, but it also ensures business continuity shortly after severe weather events, by providing field staff with guidance in preparing for an emergency or recovery from a natural disaster. Republic starts planning as soon as we learn of an impending storm. For example, in 2019, Hurricane Dorian was bearing down on the Southeast, where Republic has collection, recycling and landfill operations. The business continuity teams prepared for protection of our people and their families, our assets and our customers. We discuss and arrange shelter locations and ensure that all employees are safe and secure before the storm strikes. We also move trucks and equipment to high ground, secure recycling facilities and place landfills into safe mode. Finally, we provide guidance to our customers to prepare their carts and containers to withstand the storm and to prevent them from becoming a hazard during the storm. These actions help to minimize impact to our people and assets during the storm and ensure we can be back up and running as soon as possible after the storm passes. This plan was initially developed following the 2005 Hurricanes Katrina and Rita recovery efforts and was most recently deployed in 2021. Republic also maintains property and other forms of insurance to protect against catastrophic losses of assets. Cost of response: For 2021, costs to manage this risk continue to be incorporated into our business-as-usual activities, but do include insurance premiums, program management costs associated with developing and maintaining the Emergency Preparedness and Disaster Recovery Plan for Field Staff, training that is done each year to make sure the local coordinator is up to speed, and cost to maintain back-up generators. In total, this cost for 2021 was roughly $2.5M incremental to the business.

Comment

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Market	Changing customer behavior

Primary potential financial impact
Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
We purchase or collect and process recyclable materials such as paper, cardboard, plastics, aluminum and other metals for sale to third parties. In 2021 this accounted for 12% of our total revenue. Our results of operations may be affected by changing prices or market requirements for recyclable materials. The resale and purchase prices of, and market demand for, recyclable materials are volatile due to changes in economic conditions, governmental regulation, and numerous other factors beyond our control. For instance, in 2017 the Chinese government imposed strict limits on the import of recyclable materials. These limitations significantly decreased the global demand for recyclable materials and resulted in lower commodity prices. In the American context, consumer handling and sorting of recyclables is limited in magnitude and quality. Lower quality and poorly sorted recyclables incur increased handling costs and reduced commodity value. Our performance may be affected by changing prices or market requirements for recyclable materials. The resale and purchase prices of, and market demand for, recyclable materials are volatile due to changes in economic conditions, lack of market/social drivers and numerous other factors beyond our control.

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
10000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
At 2021 volumes and mix of materials, we believe a $10 per ton change in the price of recycled commodities has the potential to change both annual revenue and operating income by approximately $10 million per million tons sold. We calculate this using several factors that impact our operating costs and revenues. We then compare the difference in costs and revenues resulting from the associated adjustments in the price of our commodities sold. The potential financial impact includes factors beyond volume and material mix, including municipal billing cycles and other factors that impact billed rates. In 2021, recycled commodities increased revenue by 0.3% primarily due to increased commodity prices. In short, consumer demand for products made from recycled inputs drives up commodity prices and consumer ability to recycle correctly drives down recycling processing costs.

Cost of response to risk
0

Description of response and explanation of cost calculation
Management action case study: In order to drive increased demand for and the value of recycling, we actively provide education in numerous communities to help consumers and businesses understand the value of recycling and the importance of proper separation of recyclables to minimize contamination. Republic's Recycling Simplified consumer education campaign won the 2019 Best Recycling Public Education Program Award from the National Waste & Recycling Association, which recognizes innovators and leaders in the industry who have made substantial contributions to American recycling through partnerships, public education and innovations in recycling facilities. Winners were selected by a panel of judges who are professionals in the waste and recycling industry as well as from other technology and education organizations. After the 2018 launch of the Recycling Simplified initiative and a supporting national public relations campaign, we executed a $2 million multichannel marketing campaign in 2019 in six cities to further help reduce contamination rates by focusing on what and how to recycle correctly. The local campaigns employed radio ads, billboards and social media to reach residents. In two of the markets, pre- and post-campaign audits were conducted on residential recycling routes, which found that contamination rates had decreased significantly in both communities. In addition, we are working with our customers to move to a more sustainable economic model that includes a fee for the services we provide and a more equitable commodity risk sharing arrangement. This action will reduce our risk exposure in the future. Cost of response: The cost of management of this risk includes our community training programs and materials, and recycling contract management program. However, implementation of the training program and the contract management program result in positive benefits through cleaner recycling streams, and therefore greater revenue, that outweigh all the management costs. Therefore, this cost was negative (zero entered in the field above, as a negative number is not allowed) given the positive operating return for the year ended December 31, 2021.

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 direct costs

Company-specific description
Many municipalities and residents are concerned about greenhouse gas and air emissions from large heavy-duty truck fleets, especially diesel-powered. Some have passed regulations and/or ordinances to mitigate these impacts, for example our customer, the City of Los Angeles. Republic has responded to this concern by converting 21% of our fleet to natural gas sourced as renewable natural gas (RNG). The use of RNG lowers our operational costs in two ways. First, any CNG use (including RNG) insulate us from price increases and fluctuations associated with diesel fuel, which is often subject to regulatory taxes and tariffs, in 2021 the cost of diesel averaged $3.48 while CNG averaged $2.63 DGE making natural gas vehicles $0.85 cheaper per DGE to operate. Second, in addition to the broader CNG cost benefits, RNG is priced even lower by utilizing tax and/or renewable energy credits. The renewable fuel standards that the US EPA sets annually affect the type of fuel our motor vehicle fleet uses. Pursuant to the Energy Independence and Security Act of 2007, the US EPA establishes annual renewable fuel volume requirements for four different categories of renewable fuels (renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel). These volume requirements set standards for the proportion of refiners' or importers' total fuel volume that must contain renewable fuels (as designated by regulation). The total volume metrics for each year vary based upon a number of factors (e.g., the availability of such fuels), and it is difficult to predict the ultimate quantity that the US EPA will eventually mandate for future years. These regulations are one of many factors that may affect the cost of the fuel we use in operations. In addition to reduced operational costs and reduced environmental emissions as positive impacts, switching to a lower emission fuel also provides us with a competitive advantage that can translate into additional contract wins.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
3978000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
As an example, the annual monetary savings, investment required, and payback period are representative for a 10-year project of 100 vehicles and 1 fueling station, CNG at $2.63/DGE, diesel at $3.48/gal and other deployment related variables. Total investment to manage this opportunity was $2.0M with savings of $3.98M. Using DOE values from the Clean Cities Alternative Fuel Price Report and accounting for spread of operations and area of use, we found the initial investment we will break even at the end of 10-years.

Cost to realize opportunity
2000000

Strategy to realize opportunity and explanation of cost calculation
Management action case study: Using renewable natural gas (RNG) vehicles provides us a competitive advantage in communities with strict clean emission initiatives that focus on protecting the environment. This is a two- step process which included introduction of CNG vehicles and fueling stations, which we began over 10 years ago, followed by the growing use of RNG, which began in 2016. With 21% of our fleet comprised of CNG vehicles, running on RNG, we are looking to the next step of alternative vehicle conversion. We have begun pilot testing of electric vehicles in multiple markets, and over the next several years we expect to replace the remainder of our diesel vehicles with electric vehicles as part of our ordinary annual fleet replacement process. In the meantime, decisions for our CNG fueling stations and fleet are based in part on municipal contracts that favor companies that can meet the strictest air emissions requirements or companies that are leading sustainability brands. These communities are prevalent on the West coast, East coast and some parts of the Midwest. Republic is able to win these contracts by demonstrating our commitment to RNG as a clean fuel.

Comment

Identifier
Opp2

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Resilience

Primary climate-related opportunity driver
Other, please specify (Essential service to aid climate related recovery)

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Republic provides waste management services in 41 states across the U.S. where we have seen an increase in frequency of severe weather events over the last decade.

While these events can cause service disruption during the actual storms, the clean-up efforts required after an event typically result in an increase in demand for our services due to storm damage to buildings, infrastructure, trees and other natural areas that require quick, reliable transport and responsible disposal or recycling. We have business continuity plans in place for severe weather, natural disasters and other emergencies—hurricanes, tornadoes, flooding, winter storms, earthquakes and wildfires, among others—to help limit disruptions in our operations and help ensure the continuity of our services.

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)
<Not Applicable>

Potential financial impact figure – minimum (currency)
1000000

Potential financial impact figure – maximum (currency)
10000000

Explanation of financial impact figure
Our operations can be favorably affected by severe weather, which can increase the volume of waste in situations where we are able to charge for our additional services or provide services when our competitors are not able to operate due to storm damage to their assets or operations. Republic estimates revenue from these events to range from $1-10 million, based on the amount of incremental material created by the storm and Republic market share in the affected areas. As an example, the Solid Waste Association of North America estimated that Hurricane Michael in 2018 resulted in 13 million tons of storm debris in two counties. Assuming 75% of storm debris is taken to landfills at an average FEMA landfill rate of $10/ton, this would result in $97.5M of incremental revenue opportunity. If Republic was awarded a 10% share of this business, we would receive $9.75M in storm related revenue. This revenue can be offset or exceeded by costs for overtime, extra hauling distances, etc. caused by the amount of debris over and above typical daily collection needs of the community.

Cost to realize opportunity
2500000

Strategy to realize opportunity and explanation of cost calculation
Management action case study: In 2021, we took the opportunity to invest more capital into our Emergency Preparedness and Disaster Recovery Plans in to better position ourselves in the event of climate or natural disasters. This investment allowed us to make significant progress towards preparation plans in addition to yearly supply restocking, for example we invested in supporting electrical work to install switches so our larger generators are “plug and play” when they are needed. Our plan for field staff not only prepares us for impact to our assets, it also aims to keep our business, an essential service, up and running. The plan provides field staff with guidance in preparing for an emergency or recovery from a natural disaster. Republic starts planning as soon as we learn of an impending storm. For example, in 2019, Hurricane Dorian was bearing down on the Southeast, where Republic has significant operations. The business continuity teams planned in advance for protection of our people and their families, our assets and our customers. These actions helped minimize impact to our people and assets to ensure we were back up and running as soon as possible after the storm passed. Republic begins operations as soon as local emergency management officials give the go ahead. We begin by ensuring that all employees are accounted for and assess damage to their personal property. We also ensure they and their families have meals, clothing and daily necessities. Our teams then resume collection of solid waste and recycling once roads are clear and we provide storm debris removal where contracted by FEMA. Our early preparation generally enables us to be one of the first service providers back on the streets, which positions us well to win storm debris removal contracts and to pick up business where our competitors are not able to resume operations as quickly. The Plan was initially developed following the 2005 Hurricanes Katrina and Rita recovery efforts and continues to be evaluated and implemented annually. Cost calculation: Costs to manage this opportunity are incorporated into our business-as-usual planned spending activities, but do include program management costs associated with developing and maintaining the Plan document, annual training is done each year to keep the local coordinator up to speed, and cost to maintain generators. In 2021, this cost was roughly $2.5M incremental to the business.

Comment
There can be costs associated with the revenue opportunity due to costs for overtime, extra hauling distances, etc. caused by the amount of debris over and above typical daily collection needs of the community. These costs are not factored into the above cost to realize opportunity as they are highly variable and unpredictable.

Identifier
Opp3

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Development of new products or services through R&D and innovation

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Republic sees a broad societal trend toward landfill diversion, driven in part by concerns over climate change. Landfills are a known source of GHG emissions and a significant portion of Republic’s footprint. We are actively looking for ways to reduce organic materials in our landfills that generate methane upon decomposition, like fiber, food, and yard waste. Recycling and composting not only removes organics from landfills, but it returns recycled materials to industries that have large carbon footprints associated with their mining and/or production, such as aluminum, plastic, metals, and fertilizers. As such we have invested $46.4M into upgrading our recycling facilities and an additional $7.7M in organics processing infrastructure to more efficiently handle and capture materials. As of December 31, 2021, we operate 71 recycling facilities and have publicly committed to increase our recovery of key materials by 40% on a combined basis by 2030. The investment in these facilities enabled us to process and sell a combined 3.2 million tons of recycled material and organics in 2021. In 2022 we announced the development plans for the nation's first integrated plastics recycling facility, managing recyclables from curbside collection to delivery of high-quality recycled content for consumer packaging, which will directly address increasing demand from consumer brands and packaging manufacturers for recycled plastic, enabling greater circularity. Republic anticipates opening two to three more centers to provide national coverage and further drive circularity.

Time horizon

Short-term

Likelihood
Very likely

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1350977967

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Our 2021 recycling and organics collection, processing and commodity sales were approximately, $1.35 billion or 12% of our revenue. We have an opportunity to retain and/or gain business by providing alternative methods of managing waste, such as recycling and composting. In 2021 we managed 7.3M short tons (6.6M metric tons) of recycled material and 1.0M short tons (0.92M metric tons) of organic material. We are investing in innovative recycling technology and have expanded our organics operations to help customers meet their diversion goals. We are committed to increasing market demand for recycling and recycled commodities.

Cost to realize opportunity
54252093

Strategy to realize opportunity and explanation of cost calculation
Management action case study: As population increases, we expect waste generation to increase, however, there is a growing trend of waste diversion to alternative options beyond landfills, such as recycling and composting. Many of our customers voluntarily are diverting waste from landfills while also working to reduce the amount of waste they generate. Additionally, many of the largest companies in the U.S. are setting zero-waste goals in which they strive to send no waste to landfills and some jurisdictions have enacted or are considering waste reduction regulations such as extended producer responsibility, organic diversion and minimum recycled content regulations. Our strategy to capture this opportunity is to invest in recycling and composting facilities and expand our capabilities. We continue to invest in proven technologies to control costs and to simplify and streamline recycling for our customers. For example, we use robotics and advanced sorting equipment, such as disk screens, magnets and optical sorters, to identify and separate different kinds of paper, metals, plastics and other materials increasing efficiency and maximizing our recycling volume. Many of Republic's composting facilities are technologically advanced, using mechanical aeration to speed up the biological process and reduce odors. The facility at the Otay Landfill in Chula Vista, Calif., is an innovative example – it's completely off the grid, using solar-powered fans and a cover technology that requires little energy consumption and traps odors, dust and emissions. At the end of 2021, we operated 71 recycling processing centers. We will continue to look for opportunities to expand our recycling capabilities in markets where customers are demanding these services and demonstrating a willingness to pay, and we can earn an appropriate return on our investment. We were able to turn this opportunity into a profitable new line of business, with a separate business model from our core collection business which incorporated our sustainability strategy. This also allowed us to respond to our stakeholders' concerns about landfill emissions. Cost calculation: We invested approximately $46.5 and $7.7 million of capital in 2021 to expand, refurbish, build and acquire assets in our recycling and organics business for a total investment of $54.3M.

Comment
In addition to our recycling and organics business we have heavily invested in our environmental solutions business line, including the $2.2 billion acquisition of US Ecology which will allow us to provide customers with environmentally responsible solutions to manage their waste needs including treatment, consolidation and disposal of solid and liquid material, field and industrial services, rental, and in-plant services, such as transportation and logistics. In 2021, approximately 2% of our revenue was derived from environmental solutions.

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan
Yes, we have a transition plan which aligns with a 1.5°C world

Publicly available transition plan
Yes

Mechanism by which feedback is collected from shareholders on your transition plan
Our transition plan is voted on at Annual General Meetings (AGMs)

Description of feedback mechanism
<Not Applicable>

Frequency of feedback collection
<Not Applicable>

Attach any relevant documents which detail your transition plan (optional)
Republic Services is frequently in discussion for opportunities to reach a low-carbon transition plan. It is our intention to publish a plan which builds off our SBTi and include the plan as a scheduled resolution item at our AGM.
Press Release of SBT.pdf

Explain why your organization does not have a transition plan that aligns with a 1.5°C world and any plans to develop one in the future
<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy
<Not Applicable>

C3.2

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

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

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

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios: IEA 450	Company-wide	<Not Applicable>	i) Republic Services conducts ongoing assessments of climate impacts and corresponding Republic sites that may be in regions with measurable levels of water, heat or precipitation risks. To evaluate impact on our operations we considered square footage of facilities with a focus on facilities that were in regions moderately or highly impacted by the scenario analysis. Assumptions/estimates were used to fill gaps for missing data on square footage to create portfolio wide intensities. This method was selected because it allows for a comprehensive yet efficient assessment of key risks across our portfolio of sites. ii) Republic's risk assessment identifies the regions and sites which may have drought, flood, or heat risk(s) today and in the future. We used a business-as-usual stress and demand scenario in 2030, thus our time horizon used WRI's BAU and Future scenario's which align with IEA450 from current to 2030 as well as performing RCP4.5 and RCP8.5 for heat and precipitation. These assumptions are relevant with our corporate strategy and length of asset ownership for landfills. iii) The analysis includes our owned and operated sites by type and considers key factors identified by the WRI Aqueduct tool and IPCC standards to identify and characterize our operations across potential water-stressed regions, floods zones, and extreme heat impacts. i) Results - Based on the assessment undertaken to date, we have not directly changed our business strategy in relation to these risks caused by climate change. ii & iii) One of the inputs into our analysis initially considered whether these risk occurrences could have a substantive impact at any of our landfill sites, and if so, how would the business respond to both existing sites and future sites where risks may be higher based on WRI Aqueduct and RCP scenario data. As an example, while Republic did determine that 19% of our landfills (by square footage) are in watersheds with an extremely high level of flood occurrence, we confirmed the management and safety plans for these sites and determined that the actual impacts of floods on these sites are manageable, and thus would not substantively impact our business operations, community or employee health, and/ or growth strategy. Through this analysis, we are creating an open dialogue with our operations teams which has started to inform our strategic growth strategy for operational excellence, safety, compliance and efficiency performance across all of our sites.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

For our climate scenario analysis Republic is focusing on analyzing chronic changing temperature and precipitation patterns to build an understanding of our exposure to physical climate risks. This analysis prepares Republic to identify key locations that may need additional investment in adaptation and mitigation strategies and resources to support resiliency to climate change.

Results of the climate-related scenario analysis with respect to the focal questions

Rising Temperatures - The results for the RCP 4.5 heat assessment indicate that 1,035 sites will have impacts of temperature increases 1.5 degrees or greater, while RCP 8.5 indicates this number to be 1,116. The occupational risks of heat stress may include restricted physical functions and capabilities, work capacity, and productivity. Increasing temperatures is widely cited in literature as a primary driver of employee productivity loss. To understand potential future impacts of increasing heat, Republic examined the impacts of historical heat waves such as the Pacific Northwest heat wave and did not find a noticeable correlation between heat and productivity loss or employee turnover. However, Republic understands that the past exposure may not be indicative of future impacts. Compounding implications may arise from an overall increase in baseline temperatures. To address and mitigate the potential implications of extreme temperatures on our employees, Republic implemented a Summer Safety Plan including our annual '101 Days of Summer' program, which aims to educate, set actions and expectations to ensure a safe and successful summer season. This includes protocols for ensuring truck A/Cs are properly functioning months prior to the season, employees are adequately hydrated while enroute, and specific cooling PPE is provided to outdoor workforce. A secondary impact on our operations from rising mean temperatures is increased building cooling and energy costs. As temperatures rise, demand for cooling will increase, impacting the prices and reliability of power to facilities. Precipitation Change - The results of the RCP 4.5 assessment indicate that 207 sites are expected to see impacts due to precipitation change while the results of RCP 8.5 indicate this number to be 977 sites impacted by precipitation change. We estimate that our largest business implication from increased precipitation comes from the potential for increased landfill leachate. Leachate can be costly to manage properly because of the level of treatment required before it can be discharged back into a water system. Some wastewater treatment plants require pretreatment or are increasing their rates for incoming leachate. In addition to leachate at landfills, a significant increase in precipitation could generate an increase in cost to stormwater management protocol. This could be in the form of upsizing existing infrastructure, increased costs related to permitting, or liabilities from unmanaged stormwater due to large storm events. The secondary driver of business implications from precipitation increase is attributed to a delay in service either through building damages or transportation infrastructure damages from flooding. A key note is that for Republic, this is not likely to result in revenue loss as Republic has long-standing relationships and contracts with our customers but would rather be a delay in revenue as the service will continue once operations are running.

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	Recycling (C2.4a, Opp 3): Risks and opportunities related to the shifting market demand for waste solutions that result in fewer greenhouse gas emissions have influenced our municipal, commercial, and residential service offerings. Case study of substantive decisions - Republic created a strategic initiative in 2012 to provide recycling collection and processing services in markets with high demand in response to climate concerns of our customers. We partner with customers to develop new contractual arrangements that are dynamic and mutually beneficial, and incentivize improved recycling behaviors, bringing simplification to customers and the general public alike on what and how to recycle. Each year during our annual budgeting process we determine where to invest capital to expand, modernize or establish our recycling capabilities based on market demand as indicated through our annual Market Planning and Development Process. We are committed to recycling for the long term and continue to invest in technology that increases efficiencies and maximizes the recovery of higher quality recyclables. We recognize our facilities must continually evolve to address consumer trends, as well as changing package designs and unprecedented levels of contamination. In 2021, Republic invested $38 million in technology and equipment upgrades at our recycling facilities and an additional $7.7 million at our organics facilities. These investments enable us to provide an industry leading recycling and composting services to our customers. These services are not mandated across all markets, however, in 2021, the percent of customers receiving these services by service type was as follows: Recycling Residential - 75% Commercial - 26% Industrial - 26% Organics Residential - 25% Commercial - 2% Industrial - 2% Our 2021 revenue from recycling and organics was $420.5M not including our revenue from hauling these materials. These activities improve diversion from landfills and reduces the emissions associated with organic decomposition. Time horizon – this opportunity spans short, medium and long-term as we are experiencing demand for recycling today and these facilities have a ten-to forty-year lifetime.
Supply chain and/or value chain	Yes	Lower emission fuel/energy sources (C2.4a, Opp 1): Risks and opportunities related to the market demand for lower emission fuel sources and the desire to insulate our business from potential regulations on fossil fuel have influenced our supply chain strategy with our key truck/engine suppliers. Case study of substantive decisions - Leveraging lower emission fuel sources requires working with major truck/engine suppliers and developing relationships with new fuel and fueling station suppliers. As the operator of one of the largest fleets in the country, these efforts are strategic to our supply chain department. Republic has worked with key suppliers over the past several years to develop and deploy clean fuel engines (CNG), as well as, the development and installation of CNG fueling stations. Our previous investments in CNG trucks and fueling stations have made the use of RNG seamless. We have worked with suppliers to create and purchase RNG as a drop-in fuel replacement for CNG. Using trucks powered by RNG helped us meet our previous emissions goal, established in 2014, earlier than expected. Currently 100% of our collection vehicles that operate on natural gas, 21% of our total fleet, are powered by RNG. We are taking a leadership position in electric technology innovation for our fleet. This is a critical step toward reducing our environmental impact through lower fleet emissions and will also improve our total cost of ownership while providing competitive advantages in certain communities. We are partnering with multiple manufacturers to pilot electric-powered trucks. Our EV pilot is underway with 5 vehicles operating routes in 2021 covering over 14,600 miles. We will apply what we learn from these programs to future electrification initiatives. Time horizon – this opportunity spans short to medium-term as we are rolling out RNG-ready trucks today. As our diesel vehicles reach the end of their 10-12-year lifetime, we will begin replacing them with electric vehicles over the next 5-10 years.
Investment in R&D	No	Republic does not incur material R&D expenses, apart from those outlined previously in this report
Operations	Yes	Diesel Fuel Costs (C2.3a, Risk 1): Potential and realized increases to fossil fuel costs due to regulations and taxes aimed at reducing greenhouse gas emissions related to fossil fuels have led Republic to develop a strategic program to seek alternative sources of fuel to mitigate climate change impacts for our customers and our business. Case study of substantive decisions – Our recycling and waste collection trucks are complex, high-performance machines designed to be safe, comfortable and efficient. As we retire and replace older trucks, we are able to take advantage of advancements in alternative fuels in addition to safety technology and other modern efficiencies. Trucks running on alternative fuels and RNG emit fewer emissions and are less carbon intensive, which is why we continue to transition our fleet toward natural gas. Our alternative fuel programs are typically executed by Corporate and rolled out to the operations teams strategically based on the age of the vehicles in each local business unit and local demand for lower emissions collection vehicles. Powering our fleet with renewable natural gas is one way we are lowering our emissions. We partner with Clean Energy Fuels to help us manage our 40 natural gas fueling stations and to deliver RNG to those stations. In 2019, we initiated three expansion projects to further our commitment to use renewable natural gas as a bridging fuel to lower fleet emissions. With one of the largest vocational fleets in the country, using innovative technology to reduce emissions is vital. In 2021, we added 157 new CNG trucks, bringing the number of vehicles running on alternative fuels to more than 3,300. For a representative project at a single operating site, this can result in cost savings of $4.4M over a 10-year period. As of December 31, 2021, 21% of our fleet operated on renewable natural gas. Time horizon – this opportunity spans short to medium-term as we are purchasing RNG as a bridge fuel today and our initiative will span 5-10 more years as we continue to use RNG bridging the gap to the eventual transition to electric vehicles.

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	Revenues Direct costs Indirect costs Capital expenditures Capital allocation	Most of the states in which we operate landfills require counties and municipalities to formulate comprehensive plans to reduce the volume of solid waste deposited in landfills through waste planning, composting, recycling or other programs. In addition, many of the largest companies in the U.S. are setting zero-waste goals in which they strive to send no waste to landfills. Although such actions help to protect our environment and reduce the impact of waste on climate change, they may reduce the volume of waste going to landfills and which may affect the prices that we can charge for landfill disposal. We identified a risk that we would not be able to operate our landfills at their current volumes or charge current prices for landfill disposal services due to possible decreases in demand for such services. We call this trend the “evolving ton” and have been tracking and managing it for many years. Our response in 2012 was to launch a strategic initiative to develop traditional recycling in select and prioritized markets to capitalize on this trend. This initiative primarily impacts revenue planning, because we have developed a new revenue stream, and capital planning to develop the recycling infrastructure. Republic strategically built out this infrastructure and capability over the past several years. As of December 31, 2021, we had 71 recycling facilities across the US. We continue to invest in this initiative as shown by our $50M investment in the Republic Services Polymer Center making us the nation's first integrated plastics recycling facility. Revenue: In 2021, recycling processing and commodity sales were $420.5M, on a top line revenue of $11,295M. It should be noted that this does not include revenue from recycling collection as it is not broken out separately in many of our contracts or our financial statements. As consumer demand for recycling services has increased, we have met that demand by integrating recycling components to each of our collection service offerings. Capital expenditures and allocation: During our annual strategic planning process, we identify requirements for continued efficient capital allocation and organic growth opportunities for capital expenditures. The proportion of each is factored into our annual financial planning process to ensure that the business meets its cash flow and growth objectives. Capital allocations for our recycling strategic initiative change each year based on market dynamics. As of December 31, 2021, we operated 71 recycling processing centers and invested $35M in 2021 on recycle processing center expansions, refurbishments, construction and acquisitions and an addition $7.7M in our organics recycling business. We continue to invest in proven technologies to control costs and to simplify and streamline recycling for our customers. For example, robotics and advanced sorting equipment, such as disk screens, magnets and optical sorters, identify and separate different kinds of paper, metals, plastics and other materials to increase efficiency and maximize our recycling efforts. Time horizon of influence – this opportunity spans short, medium and long-term as we are experiencing demand for recycling today and these facilities have a ten-to forty-year lifetime.

C3.5

(C3.5) In your organization’s financial accounting, do you identify spending/revenue that is aligned with your organization’s transition to a 1.5°C world?

Yes

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization’s transition to a 1.5°C world.

Financial Metric

CAPEX

Percentage share of selected financial metric aligned with a 1.5°C world in the reporting year (%)

8.8

Percentage share of selected financial metric planned to align with a 1.5°C world in 2025 (%)

27.1

Percentage share of selected financial metric planned to align with a 1.5°C world in 2030 (%)

22.4

Describe the methodology used to identify spending/revenue that is aligned with a 1.5°C world

To calculate the percentage in the reporting year, we identified the amount of spend that was allocated toward emission reducing activities such as recycling and organics, landfill gas to energy projects, CNG truck purchasing, etc. compared to total capital expenditures. To calculate the percentage moving forward we assumed that total capex increased by 4.6%, which is in line with the prior 3-year period. Where future investment is known or announced values were updated and where unknown the level of investment was kept at the same percentage as the current year.

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

2018

Target coverage

Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Market-based

Scope 3 category(ies)
<Not Applicable>

Base year
2017

Base year Scope 1 emissions covered by target (metric tons CO2e)
14909948

Base year Scope 2 emissions covered by target (metric tons CO2e)
264877

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
15174825

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
98

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
2

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2030

Targeted reduction from base year (%)
35

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
9863636.25

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
13643797

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
220053

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
13863850

% of target achieved relative to base year [auto-calculated]
24.6832688821311

Target status in reporting year
Underway

Is this a science-based target?
Yes, and this target has been approved by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
We have adopted an aggressive target for reducing our operational GHG emissions, approved by the Science Based Targets initiative (SBTi). Goal: Reduce absolute total Scope 1 and 2 greenhouse gas emissions 35% by 2030. Scope 1 emissions include emissions from landfills and fleet that are owned, leased, or operated by Republic. From the baseline year of 2017 to 2021, Republic achieved a 16.9% reduction in Scope 1 fleet emissions and an 16.9% reduction in total Scope 2 emissions (See 2021 GRI topic 305-1, and topic 305-5, respectively). Our Scope 1 landfill emissions decreased by 8.7% (See 2021 GRI topic 305-1). This results in a total Scope 1 and Scope 2 decrease of 8.7% since 2017, resulting in 24.9% of target achieved. For the year 2021 reporting we calculated our landfill emissions using the SWICS methodology. Due to this methodology change as well as some notable acquisitions have rebaselined our emissions from 2017 forward. Despite this updated approach we do not believe the landfill portion of the Scope 1 emissions is reflective of our performance. Landfill emissions are calculated using a modeled approach through SWICS and U.S. 40 CFR Part 98 Subpart HH, a method developed by the EPA and waste industry to characterize the contribution of landfills in relationship to the overall greenhouse gas footprint in the U.S. As a part of our efforts to reduce GHG emissions Republic increased biogas collection by 3.81% across all landfills in 2021 from our baseline goal in 2017. This initiative helps us by reducing the amount of fugitive methane escaping from our operations and provides us the opportunity to convert this gas into a usable form of energy. We continue using the federally mandated methodology to reflect our landfill emissions until we develop the means for more accurate and continuous measurement, which we have committed to investigate in support of our science-based GHG emissions target.

Plan for achieving target, and progress made to the end of the reporting year
To reach our target of 35% GHG reductions in our Scope 1 emissions Republic has entered into a partnership to develop 39 new RNG facilities across the US. The initiative is expected to generate substantial progress towards Republic's long-term sustainability goal to beneficially reuse 50% more biogas by 2030 while also reducing the fugitive emissions from landfills. Republic is also investing in alternatives to landfills as demonstrated by our $50M investment in the Republic Services Polymer Center making us the nation's first integrated plastics recycling facility. This initiative will help reduce the amount of materials in landfills and lower our Scope 1 impact. We are taking a leadership position in electric technology innovation for our fleet which is a critical step toward reducing our environmental impact through lower fleet emissions. These

initiatives as well as improved efficiency and the incorporation of other technologies, such as RNG in our fleet, has been impactful as shown by the 9% reduction in emissions that we have achieved from our baseline year of 2017.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

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
2018

Target coverage
Company-wide

Target type: energy carrier
Other, please specify (Biogas)

Target type: activity
Production

Target type: energy source
Renewable energy source(s) only

Base year
2017

Consumption or production of selected energy carrier in base year (MWh)
58513

% share of low-carbon or renewable energy in base year
0

Target year
2030

% share of low-carbon or renewable energy in target year
100

% share of low-carbon or renewable energy in reporting year
8

% of target achieved relative to base year [auto-calculated]
8

Target status in reporting year
Underway

Is this target part of an emissions target?
Yes. Increasing beneficial reuse of biogas collected at landfills results in lower greenhouse gas emissions at landfills. These emissions contribute to the Scope 1 landfill emissions that are part of the SBT described above. Our goal is to increase biogas collected for beneficial reuse by 50% from a baseline of 2017 in the year 2030.

Is this target part of an overarching initiative?
Science Based Targets initiative

Please explain target coverage and identify any exclusions
Overarching initiative: We have adopted an aggressive target for reducing our operational GHG emissions, approved by the Science Based Targets initiative (SBTi) and aligned with the UN “Climate Action” SDG 13.2 - reduce greenhouse gas emissions. Goal: Reduce absolute total Scope 1 and 2 greenhouse gas emissions 35% by 2030. Scope 1 emissions include emissions from landfills and fleet that are owned, leased, or operated by Republic. Supporting goal: Our operating strategy for managing landfill gas (LFG) emissions is to maximize LFG collected at each landfill. By safely collecting the maximum amount, we minimize any LFG escaping as fugitive emissions, particularly high GWP methane. The collected LFG is either beneficially reused as renewable energy or thermally oxidized to CO2 in a flare. We have a distinct goal to increase biogas sent to beneficial reuse by 50% by 2030 (from a 2017 baseline), by growing our capacity of regenerative landfills. By diverting biogas to beneficial reuse, we avoid extraction and use of fossil fuels, displacing the need for environmentally damaging activities like fracking and oil sands prospecting. For the C4.2a calculation, we report % share in target year as 100%, indicating that we have fully achieved our 2030 renewable energy goal, described in this paragraph. Our % share in the reporting year represents an increase of 2,181 MWh, which is 8% of the total increase needed to achieve our 2030 goal. For additional information about our biogas goal (reported in standard cubic feet) please refer to our Sustainability Report at www.republicservices.com/sustainability

Plan for achieving target, and progress made to the end of the reporting year
This year Republic Services and Archaea Energy, Inc. announced a joint venture to develop 39 RNG projects across the country. The partnership, the country's largest RNG portfolio build-out to date, will convert landfill gas into pipeline-quality RNG that can be used for a variety of applications to displace gas from fossil fuels. The initiative is expected to generate substantial progress towards Republic's long-term sustainability goal to beneficially reuse 50% more biogas by 2030.

List the actions which contributed most to achieving this target
<Not Applicable>

C4.3

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

C4.3a

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

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	4	
To be implemented*	3	720926
Implementation commenced*	0	
Implemented*	5	20721771
Not to be implemented	2	

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	Biogas

Estimated annual CO2e savings (metric tonnes CO2e)
290453

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
16723919

Investment required (unit currency – as specified in C0.4)
53600000

Payback period
1-3 years

Estimated lifetime of the initiative
6-10 years

Comment
Republic has a number of initiatives in progress to reduce the amount, as well as, the carbon intensity of fuel that we use, and therefore, our GHG emissions from our fleet. Since 2016, Republic has been purchasing renewable natural gas (RNG) to replace its usage of diesel in our collection vehicles. This has resulted in a decrease in the total DGE's of diesel purchased and consumed by our fleet and yields a corresponding GHG emissions reduction. We expect to continue the consumption of RNG as an alternative fuel. The savings for these projects fluctuates with the RIN price and the volume of RNG fuel used each year. The savings provided are calculated using the difference in price per DGE of Diesel and CNG. The lifetime investment figure is calculated by including only the infrastructure setup as price fluctuations in fuel create yearly variances for the investment figure.

Initiative category & Initiative type

Other, please specify	Other, please specify (Fugitive emissions reductions (Initiative Type - Waste reduction and material circularity: Waste Reduction))

Estimated annual CO2e savings (metric tonnes CO2e)
18477315

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
1350977967

Investment required (unit currency – as specified in C0.4)
54300000

Payback period
<1 year

Estimated lifetime of the initiative
16-20 years

Comment
Annual monetary savings is revenue generated from 71 recycling and 19 organics facilities in 2021. Investment varies by year, amount shown reflects 2021 capital investment. Emission reductions are calculated using the EPA WARM v15 model to determine the alternative disposal methods impact on material breakdown. We reviewed both diversion of recycled and organic material for this assessment.

Initiative category & Initiative type

Low-carbon energy generation	Biogas

Estimated annual CO2e savings (metric tonnes CO2e)
1883424

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1
Scope 2 (location-based)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
50816530

Investment required (unit currency – as specified in C0.4)
8060794

Payback period
<1 year

Estimated lifetime of the initiative
21-30 years

Comment
Republic Services has invested in the expansion of our landfill gas to energy systems. These systems are designed to capture landfill gas and refine it to a fuel grade which can be used as a replacement for natural gas. Through our efforts and the efforts of our partners we collected 35 million mmBtu of this gas. Emissions reductions are calculated by replacing traditional natural gas with the RNG that is sourced from our landfills. Republic Services operates facilities that convert landfill gas to RNG which is used as a replacement for natural gas; this energy is sent to the grid to be utilized by consumers. This action is voluntary and contributes numerous benefits to Republic Services and the communities we serve. The annual monetary savings is revenue generated from the gas that we sell for energy production. Investment varies by year, amount shown reflects 2021 capital investment. We have planned to increase these activities by partnering with Archaea Energy to develop 39 new projects and generate more than 12.5 million MMBtu of RNG annually.

Initiative category & Initiative type

Transportation	Company fleet vehicle replacement

Estimated annual CO2e savings (metric tonnes CO2e)
27

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
2026463

Investment required (unit currency – as specified in C0.4)
3000000

Payback period
1-3 years

Estimated lifetime of the initiative
6-10 years

Comment
Republic Services has invested in the development of EV's which have begun running routes in 2 states. These 4 vehicles drove over 14,500 miles in 2021. The emissions reductions for these vehicles is calculated by the amount of diesel fuel displaced with electricity and applying the US eGRID factor for the regions where these vehicles are operating. We anticipate expanding our EV operations in the coming years which will further decrease emissions associated with our fleet operations. The annual savings for this project was calculated by determining the amount of revenue generated from operations of the EV vehicles during the calendar year. The lifetime investment figure is an estimate that takes into account local, state, and federal grants and incentives for establishing our entire EV infrastructure.

Initiative category & Initiative type

Low-carbon energy consumption	Solar PV

Estimated annual CO2e savings (metric tonnes CO2e)
70551.74

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 2 (location-based)
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

<1 year

Estimated lifetime of the initiative
21-30 years

Comment
Republic Services has partnered with solar developers across 8 facilities to create new solar infrastructure. These facilities have the capacity for a combined 41.7 MW of renewable energy generation. Republic Services calculates the emission reductions for the generation of this energy compared to the US eGRID factor for the various regions they are located. For a majority of these projects Republic Services acts as a landlord leasing the land for development, for the other projects we act as the tax equity investor.

C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Our facilities and operations are subject to a variety of federal, state and local requirements that regulate, among other things, the environment, public health, safety, zoning and land use. In order to comply with regulations such as EPA landfill gas collection standards, California SB 1383 and organics diversion mandates, and the California low carbon fuel standard we have invested in infrastructure to meet or exceed the regulatory standards. These laws and regulations provide governmental authorities with strict powers of enforcement, which include the ability to revoke or decline to renew any of our operating permits, obtain injunctions, or impose fines or penalties in the event of violations, including criminal penalties.
Financial optimization calculations	In some cases, as indicated in the answers to question 4.3b above, we exceed regulatory requirements/standards and/or undertake projects to drive environmental improvements that are not contemplated by regulatory agencies. Investments in these projects are driven by a positive return on investment that often includes other factors, such as impact on our brand or license to operate.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?
Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
Climate Bonds Taxonomy

Type of product(s) or service(s)

Road	Compressed biogas engines

Description of product(s) or service(s)
Republic has been investing in compressed natural gas (CNG) collection vehicles for a number of years. In 2021, 21% of our collection fleet operated on natural gas. CNG fuel has a lower carbon footprint as compared to diesel fuel. In addition, Republic has been ramping up its use of renewable natural gas (RNG), a drop-in replacement for CNG, that has the lowest carbon intensity of any commercially available fuel today, according to the California Air Resources Board (CARB). Today, our use of RNG is at 100% of our CNG fleet vehicles as we use RNG as a bridge fuel towards electric vehicles. Use of these trucks to provide collection services to our customers can be classified as a low-carbon service offering because their use results in lower emissions for Republic as we deliver our service.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Estimating and Reporting the Comparative Emissions Impacts of Products (WRI)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Use stage

Functional unit used
Diesel Gallon Equivalents (DGE)

Reference product/service or baseline scenario used
Gallons of diesel used in our fleet.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Use stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
290453

Explain your calculation of avoided emissions, including any assumptions
To calculate avoided emissions, the actual amount of biomethane (RNG) fuel was converted to Diesel Gallon Equivalent (DGE). The DGE of fuel was then calculated to metric tons of CO2e using the EPA emissions factor for diesel. The second step is to take the actual emissions from the RNG fuel and subtracting that value from the calculated diesel value. (RNG DGE * Diesel Emission Factor) - (RNG DGE * RNG Emission Factor) = Avoided Emissions from RNG use

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
16

Level of aggregation
Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon
Climate Bonds Taxonomy

Type of product(s) or service(s)

Other	Other, please specify (Landfill Diversion)

Description of product(s) or service(s)
Republic offers a number of products and services today that enable our customers to avoid their emissions. These products include landfill gas for renewable energy; recycling of residential and commercial commodities, food waste and green waste; universal recycling (batteries, light bulbs, etc); and electronic recycling (mobile devices, televisions, etc).

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Estimating and Reporting the Comparative Emissions Impacts of Products (WRI)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
End-of-life stage

Functional unit used
Short Tons

Reference product/service or baseline scenario used
Short tons of material landfilled.

Life cycle stage(s) covered for the reference product/service or baseline scenario
End-of-life stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
18477315.44

Explain your calculation of avoided emissions, including any assumptions
Using the EPA WARM model we input the short tons of material that was recycled and composted and entered those tons as tons landfilled. The EPA WARM model provides emissions rates for mixed recyclables and mixed organics which were utilized as the alternative disposal scenario. The difference between landfilled short tons and recycled and composted short tons is the emissions avoided number. ((Short tons recycled + Short tons organics) * EPA landfill emission factor) - (Short tons recycled * EPA mixed recycled factor) + (Short tons organics * EPA mixed organics factor).

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
12

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
Yes, an acquisition
Yes, a divestment

Name of organization(s) acquired, divested from, or merged with
In 2021, Republic Services had acquisitions, consolidations, and divestitures from our portfolio, most notably our acquisitions of Santek and ACV Enviro.

Details of structural change(s), including completion dates
On May 5, we completed our acquisition of Santek which included 11 landfills, 4 hauling facilities, 8 convenience centers, 17 transfer stations, and 1 office. On September 2, we completed our acquisition of ACV Enviro which included 34 environmental services facilities. With these acquisitions we also divested from 19 of our own assets.

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in methodology Yes, a change in boundary	As detailed previously in section C5.1a Republic Services numerous acquisitions in 2021. This activity as well as methodology changes, highlighted by calculating our landfill emissions using the SWICS three-tiered approach, have led us to rebaseline our emissions from our baseline year (2017) to our current reporting year. The following are the methodology and boundary changes that were implemented to our emissions calculations. • All acquisitions, divestitures and methodology changes that have occurred during the reporting period are accounted for through all years reported in this report, back to the 2017 baseline year for our 2030 goal; • Our greenhouse gas (GHG) inventory includes only emissions from landfills where we have operational control to manage landfill gases, which are the vast majority of the landfills where we have activities; • Landfill emissions calculations were conducted using the SWICS 3-tier approach, allowing us to more accurately represent the emissions-reducing impacts of our investments, i.e., gas collection and landfill cover efficiency improvements; • Our fleet fuel usage methodology is more closely linked to our activities; • Our integrated utility bill software more accurately represents associated emissions, increasing the use of measured data in place of estimates; • We improved the methodology used to calculate scope 3 category 7 employee commuting; and • Employee relocation was previously reported in scope 3 category 7 and we have moved it to category 1 These revisions ensure that our goal to reduce scope 1 and 2 GHG emissions 35% below our 2017 baseline by 2030, approved by the Science Based Target initiative (SBTi) compares like-for-like assets across our reporting years.

C5.1c

(C5.1c) Have your organization's base year emissions been recalculated as result of the changes or errors reported in C5.1a and C5.1b?

	Base year recalculation	Base year emissions recalculation policy, including significance threshold
Row 1	Yes	Our recalculation policy, as outlined in our IMP, is an activity, such as an adjustment to our methodology or boundary, that results in a 1% or greater change to our emissions inventory. In accordance with this policy our acquisitions and methodology improvements in 2021 triggered a recalculation and we have rebaselined all emissions from 2017-2021.

C5.2

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

Scope 1

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
14909948

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 2 (location-based)

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
266901

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is not the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 2 (market-based)

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
264877

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 1: Purchased goods and services

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
1953184

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 2: Capital goods

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
447954

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
465206

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 4: Upstream transportation and distribution

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
344432

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 5: Waste generated in operations

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
77668

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 6: Business travel

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
11641

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 7: Employee commuting

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
167108

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 8: Upstream leased assets

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
3989

Comment
This base year is the first year that Republic began calculating and reporting a greenhouse gas inventory for emissions reductions. It is the same base year as our current SBT GHG reduction goal. Our base year emissions are restated when we make adjustments due to methodology or boundary changes.

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
Impacts and emissions for any downstream transportation and distribution have been incorporated as appropriate into the Waste Generated in Operations and/or Upstream Transportation & Distribution scope 3 GHG categories. We have no downstream transportation and distribution impacts.

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
We are unable to separately estimate scope 3 emissions impacts from downstream processing of commodities we recover, process and sell. Instead, we have estimated the full lifecycle emissions impacts from our sold products, as reported in the “Explanation” column of the “Use of sold products” category.

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
We have estimated the full lifecycle emissions impacts from our sold products, mainly recycled commodities. Total lifecycle emissions impacts, result in a negative emissions figure, which we are not accounting for in our total Scope 3 emissions figure. Lifecycle emissions include upstream mining, processing and transportation of materials that enter the waste stream, transportation and recovery/processing of commodities/compost by companies like Republic, as well as, downstream processing, transportation, and re-manufacturing where applicable. Emissions from recycled materials and compost sold are calculated using methodologies and emission factors from the U.S. EPA’s Waste Reduction Model (WARM).

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
As Republic does not purchase its “raw materials” used to create its products sold (i.e. recycled materials and compost) but rather receives these raw material inputs through its primary services of waste management collection, the emissions impacts are not captured in our Purchased Goods and Services category. They would rather be quantified as a separate upstream activity. Due to the complexity of this upstream value chain, we are not able to estimate the emissions associated with any raw material inputs, however, they are incorporated into our “Use of sold products” lifecycle calculation above, as per the EPA WARM model.

Scope 3 category 13: Downstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
Republic has determined that this Scope 3 category is not relevant to our business. All leased assets are included in the upstream leased assets category.

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
Not relevant to our operations, Republic does not have any franchises.

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
Not relevant to our operations.

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
Not relevant to our operations.

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment
Not relevant to our operations.

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
The Greenhouse Gas Protocol: Scope 2 Guidance

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)
13643797

Start date
<Not Applicable>

End date
<Not Applicable>

Comment
Scope 1 emission activities include emissions from landfills, fleet and heavy equipment fuel usage, and our facilities.

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

C6.3

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

Reporting year

Scope 2, location-based
218286

Scope 2, market-based (if applicable)
220053

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

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

Emissions in reporting year (metric tons CO2e)
1916475

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Outside of direct data collection from suppliers on their proportional emissions associated with delivery of purchased goods and services procured by Republic, the use of EEIO emissions factors offers an efficient and directional methodology to estimate the impacts associated with our spend in this category.

Capital goods

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
489554

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Outside of direct data collection from suppliers on their proportional emissions associated with delivery of capital goods procured by Republic, the use of EEIO emissions factors offers an efficient and directional methodology to estimate the impacts associated with our spend in this category.

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

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
511926

Emissions calculation methodology
Supplier-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Fuel and electricity data is supplied directly from utility companies.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
401307

Emissions calculation methodology
Supplier-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Republic maintains detailed cost data for third-party hauler and subcontract collection services that it uses to support its collection services.

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
11016

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Outside of direct data collection from suppliers on their proportional emissions associated with management of leachate waste generated by our landfill operations, the use of EEIO emissions factors offers an efficient and directional methodology to estimate the impacts associated with our spend in this category. The emissions totals for this category currently only estimate the emissions from the management of leachate waste, and do not include mixed solid waste from Republic's office and/or day-to-day operations.

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
4747

Emissions calculation methodology
Supplier-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Annual data for air travel, rail travel, and rental car travel is provided by Republic’s travel agency. Air travel data is broken out by each flight leg and the distances, which is used to calculate total short, medium and long-haul miles (Short flights (<300 mi), Med. flights (300-2300 mi), Long flights (>2300 mi). Republic’s travel agency in 2021 was able to provide miles by cabin class. UK DEFRA 2020 emissions factors with radiative forcing are used to calculate the air travel GHG emissions, based on distance threshold and cabin class. Rail travel data was provided in terms of distance traveled. U.S. EPA Climate Leaders: Emission Factors for Greenhouse Gas Inventories, 2020 were used to calculate the emissions from the rail travel mileage. The rental car report in 2021 provided fuel volumes. U.S. EPA Climate Leaders: Emission Factors for Greenhouse Gas Inventories, 2020 were used to calculate the emissions from the rental car gasoline.

Employee commuting

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
134510

Emissions calculation methodology
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Republic Services calculates employee commuting based on a US EPA assumption of 41 miles round trip per eligible employee driven in a passenger car. For 2021, many of our non-frontline workers conducted their roles remotely for the duration of the year, which we accounted for in our determination of number of employees commuting each day. We used the number of employee commuting days to calculate total mileage. We then applied EPA Table 10 Emission Factor to total mileage.

Upstream leased assets

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
2730

Emissions calculation methodology
Supplier-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
2.75

Please explain
The 2.75% of the emissions calculated using data from suppliers represents the overhead electricity emissions at our colocation data centers. The remaining 97.25% of the upstream leased assets emissions were calculating using spend data.

Downstream transportation and distribution

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Impacts and emissions for any downstream transportation and distribution have been incorporated as appropriate into the Waste Generated in Operations and/or Upstream Transportation & Distribution scope 3 GHG categories. We have no downstream transportation and distribution impacts.

Processing of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
We are unable to separately estimate scope 3 emissions impacts from downstream processing of commodities we recover, process and sell. Instead, we have estimated the full lifecycle emissions impacts from our sold products, as reported in the “Explanation” column of the “Use of sold products” category.

Use of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
We have estimated the full lifecycle emissions impacts from our sold products, mainly recycled commodities. The total lifecycle emissions impacts, result in negative emissions, which we are not accounting for in our total Scope 3 emissions figure. Lifecycle emissions include upstream mining, processing and transportation of materials that enter the waste stream, transportation and recovery/processing of commodities/compost by companies like Republic, as well as, downstream processing, transportation, and re-manufacturing where applicable. Emissions from recycled materials and compost sold are calculated using methodologies and emission factors from the U.S. EPA's Waste Reduction Model (WARM), version 15. Recycled materials sold is based on the percent of various commodities as sold by Republic in 2021. GWPs are from the IPCC (2007) Fourth Assessment Report.

End of life treatment of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
As Republic does not purchase its "raw materials" used to create its products sold (i.e. recycled materials and compost) but rather receives these raw material inputs through its primary services of waste management collection, the emissions impacts are not captured in our Purchased Goods and Services category. They would rather be quantified as a separate upstream activity. Due to the complexity of this upstream value chain, we are not able to estimate the emissions associated with any raw material inputs, however, they are incorporated into our "Use of sold products" lifecycle calculation above, as per the EPA WARM model.

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Republic has determined that this Scope 3 category is not relevant to our business. All leased assets are included in the upstream leased assets category.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Not relevant to our operations, Republic does not have any franchises

Investments

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Republic does not have any investments that are relevant to Scope 3 emissions reporting.

Other (upstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Not relevant to our operations

Other (downstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Not relevant to our operations

C6.7

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

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	6787025	There are five sources of biogenic carbon emissions that are relevant to Republic Services: CO2 from the combustion of landfill gas via flares, CO2 passing through on-site combustion devices, fugitive CO2 generated from the biological decomposition of waste in landfills, CO2 as a product of CH4 oxidation in the landfill cap, mobile combustion of biodiesel and biomethane. Biogenic emissions are treated separately from scope 1 in accordance with the GHG Protocol. Republic follows guidance from U.S. EPA on determining emissions of these sources of solid, gaseous, liquid and biomass fuels from: Mandatory Reporting of Greenhouse Gases Final Rule, 74 Fed. Reg. 56260 (Oct. 30, 2009); Tables C1 and C2 at 56409 and 56410. Republic also follows guidance from U.S. EPA on revised emission factors for selected fuels from: Mandatory Reporting of Greenhouse Gases Final Rule, 75 Fed. Reg. 79091 (Dec. 17, 2010). Sequestered Carbon Landfills act as a carbon sink, permanently, biologically sequestering carbon from municipal solid waste and removing it from the carbon cycle. Since the Greenhouse Gas Protocol does not currently allow for the accounting of avoided emissions, this total is not represented in our inventory. In 2021, Republic sequestered 27.43 MMTCO2e, as calculated using a 2008 U.S. EPA waste characterization study.

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
0.001227

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
13863850

Metric denominator
unit total revenue

Metric denominator: Unit total
11295000000

Scope 2 figure used
Market-based

% change from previous year
13

Direction of change
Decreased

Reason for change
Scope 1 and 2 GHG emissions per dollar of revenue decreased 13% between 2020 and 2021. In 2021 our revenue rose by $1,141.4M while our Scope 1 and 2 emissions decreased by 1,310,975 MT CO2e. Some of the activities that led to our emissions reduction include: recycling and organics diversion from landfills which reduces the amount of fugitive emissions; collection of gas from sites with existing LFGTE projects; conversion of our diesel fleet to RNG; and increased use of renewable natural gas in our fleet. We believe that these activities will continue to reduce our emissions despite our growing operations and have plans to further expand these activities as a part of our GHG reduction goals.

C7. Emissions breakdowns

C7.1

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

C7.1a

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

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CH4	11934211	IPCC Fourth Assessment Report (AR4 - 100 year)
CO2	1704922	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	4284	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 CO2e)
United States of America	13643797

C7.3

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

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
Landfills	11944825
Fleet (vehicles and heavy equipment)	1450956
Buildings	248016

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)
United States of America *We divested all operations outside of the United States.*	218286	220053

C7.6

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

By activity

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)
Electricity	197294	199061
Heat	20992	20992

C7.9

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

Decreased

C7.9a

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	Our Switch data center is powered by 100% renewable energy from solar photovoltaic cells. The Switch facility used 642 MWh of solar energy in 2021. Since this arrangement has been in place since 2019, there is no associated change in emissions from 2019 to 2020. This process keeps an additional 298 metric tons of CO2e from being produced based on the emission rate from eGRID.
Other emissions reduction activities	31150	Increased	2.2	As we grew our operations in 2021 we saw an increase in fuel usage causing a 2.2% increase in fleet emissions. The increase was mitigated by our continued use of RNG and in future years we expect that our fleet emissions will decrease further as we convert to an electric fleet.
Divestment		<Not Applicable>		
Acquisitions		<Not Applicable>		
Mergers		<Not Applicable>		
Change in output	458516	Decreased	3.2	With our increased efforts on biogas collection and beneficial reuse we saw a decrease of 3.8% in our landfill emissions. We expect to continue expansion and collection of our biogas efforts to further reduce our landfill emissions which account for 69% of our scope 1, 2, and 3 emissions.
Change in methodology		<Not Applicable>		
Change in boundary		<Not Applicable>		
Change in physical operating conditions		<Not Applicable>		
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	Yes
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)	LHV (lower heating value)	1238562	6975292	8213854
Consumption of purchased or acquired electricity	<Not Applicable>	1302	455501	456803
Consumption of purchased or acquired heat	<Not Applicable>	0	1368146	1368146
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	1239864	8798939	10038803

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.

Sustainable biomass

Heating value
HHV

Total fuel MWh consumed by the organization
1238562

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Consumption of biodiesel and biomethane for fleet operations.

Other biomass

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Coal

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Oil

Heating value
HHV

Total fuel MWh consumed by the organization
5725267

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Diesel, jet fuel, unleaded gas, kerosene used for fleet and heavy equipment operations.

Gas

Heating value
HHV

Total fuel MWh consumed by the organization
1485716

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Propane and natural gas used for fleet, heavy equipment, and facility operations.

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Total fuel

Heating value
HHV

Total fuel MWh consumed by the organization
8449546

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

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	441.6	0	441.6	0
Heat	80754	0	80754	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 or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method
Green electricity products from an energy supplier (e.g. green tariffs)

Energy carrier
Electricity

Low-carbon technology type
Solar

Country/area of low-carbon energy consumption
United States of America

Tracking instrument used
I-REC

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
641

Country/area of origin (generation) of the low-carbon energy or energy attribute
Please select

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

Comment
One of Republic's colocation data centers, Switch, uses 100% renewable energy to power its facilities. Republic receives an annual sustainability certificate demonstrating the amount of Solar Renewable Energy Credits that Switch retired on behalf of Republic Services that year. Per Republic's sustainability certificate for 2021, Republic's 2021 renewable energy credits were generated by Nevada solar farms during 2021.

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area
United States of America

Consumption of electricity (MWh)
456803

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
456803

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

C9. Additional metrics

C9.1

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

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	Third-party verification or assurance process in place

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
Limited assurance

Attach the statement
2021 Republic Services Sustainability Assurance Statement.pdf

Page/ section reference
1-2

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

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 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2021 Republic Services Sustainability Assurance Statement.pdf

Page/ section reference
1-2

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

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
Limited assurance

Attach the statement
2021 Republic Services Sustainability Assurance Statement.pdf

Page/ section reference
1-2

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Purchased goods and services
Scope 3: Capital goods
Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
Scope 3: Upstream transportation and distribution
Scope 3: Waste generated in operations
Scope 3: Business travel
Scope 3: Employee commuting
Scope 3: Upstream leased assets

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2021 Republic Services Sustainability Assurance Statement.pdf

Page/section reference
1-2

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.2

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

C10.2a

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

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Progress against emissions reduction target	ISO 14064-3	We have chosen to verify this additional data point as it is related to the annual verification of our organization-wide Scope 1 emissions. The emissions are reported in question C4.1a . 2021 Republic Services Sustainability Assurance Statement.pdf
C6. Emissions data	Progress against emissions reduction target	ISO 14064-3	We have chosen to verify this additional data point as it is related to the annual verification of our organization-wide Scope 2 emissions. The emissions are reported in question C4.1a . 2021 Republic Services Sustainability Assurance Statement.pdf
C8. Energy	Renewable energy products	ISO 14064-3	We have chosen to verify this additional data point as it is related to the annual verification of our organization-wide biogas collection goal. this goal has direct impacts on emissions from landfill activities. 2021 Republic Services Sustainability Assurance Statement.pdf

2021 Republic Services Sustainability Assurance Statement.pdf

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, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Our 2030 sustainability goals address the risks and opportunities surrounding critical, sustainability-related macrotrends most relevant to our business, including climate change. Given our position, regulatory and market developments related to climate change present us with the potential for strategic business opportunities. Offsetting operational GHG emissions is not enough. We are taking a bold position to leverage innovation and lead the industry in combating climate change. Landfill methane emissions, vehicle and equipment emissions, and our buildings' electricity consumption all contribute to climate change. These activities all have varying potential for regulation by a carbon pricing system in the future and are being regulated in some countries already. That is why we have adopted an aggressive target for reducing our operational GHG emissions well below 2°C, approved by the Science Based Targets initiative (SBTi). Our goal is to reduce absolute Scope 1 and 2 greenhouse gas emissions 35% by 2030, from a 2017 baseline year. We've also set an interim target to reduce absolute Scope 1 and 2 emissions 10% by 2025. These goals support the United Nations "Climate Action" Sustainable Development Goal, 13.2 – reduce greenhouse gas emissions. We will accomplish these goal through:
1. Landfill innovation (e.g., monitoring and measurement, gas collection and control systems, landfill gas-to-energy)
2. Diversion from landfill (e.g., organics processing / composting, recycling)
3. Fleet emissions reductions (e.g., electrification, route optimization, changes in driver behavior)
4. Emissions reductions when we build (e.g., site selection, building materials and insulation, energy efficiency measures)

Proactive reduction of greenhouse gas emissions in these four areas reduces our risk from future regulation. Efforts to curtail the emission of greenhouse gases and to ameliorate the effects of climate change continue to progress. Passage of comprehensive, federal climate change legislation is unlikely in the current political climate. Nonetheless, should comprehensive federal climate change legislation be enacted, we expect it to impose costs on our operations, the materiality of which we cannot predict. We do not anticipate being regulated by an emissions trading scheme in the next three years, however, it is possible that a carbon tax could be enacted at the state or federal level in the next two to three years. Based on current carbon tax or cap-and-trade programs implemented in other countries, these policies typically do not directly levy a carbon tax at landfills. Policies are most often targeted on upstream waste generators. This approach is seen in several U.S. states today as a landfill diversion target that applies a fee to customers (businesses and/or municipalities) that do not meet diversion mandates. We anticipate this type of policy as opposed to a direct landfill carbon tax. A key element of our operating strategy for managing landfill emissions is to maximize the amount of gas collected at each site. By safely collecting the maximum amount, we minimize gas escaping as fugitive emissions. The collected landfill gas is either utilized for renewable energy or combusted in a flare. As of December 31, 2021, Republic was engaged in 77 landfill gas-to-energy projects that convert collected biogas for beneficial reuse. Additionally, consumer demand for recycling services has increased in an effort to divert emissions-generating materials away from the landfill, and we have responded by integrating recycling components into our collection service offerings. Our goal is to provide a complete waste stream management solution to our customers in a vertically integrated, environmentally sustainable way.
Reducing emissions from our fleet reduces our risk in a scenario in which governments enact carbon-reduction policies. At current consumption levels, the addition of a $63/ton carbon tax, corresponding to the 2025 SDS scenario, would result in an increase in our fuel expenses, which we would expect to offset through a fuel recovery fee of approximately $72 million. We are lowering our emissions in the short-term is by using renewable natural gas (RNG) as a bridge technology to electric vehicles. With one of the largest vocational fleets in the country, using innovative technology to reduce emissions is vital. In 2021, we added 159 natural gas trucks and 4 electric trucks, bringing the number of vehicles running on alternative fuel to more than 3,300. Our natural gas-powered trucks replace older, diesel powered vehicles; run on RNG; and help decrease emissions and reduce unwanted noise. For more information about our GHG emissions goal, our progress and related initiatives, please refer to the Climate Leadership section of our 2021 Sustainability Report, our 2021 GRI Report (Standard 305), and our TCFD Report. These reports are available at www.republicservices.com/sustainability.

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, but we 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/clients

C12.1a

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

Type of engagement
Innovation & collaboration (changing markets)

Details of engagement
Run a campaign to encourage innovation to reduce climate impacts on products and services

% of suppliers by number
0.2

% total procurement spend (direct and indirect)
19

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

Rationale for the coverage of your engagement
Our engagement is focused on our SBTi approved goal to reduce GHG emissions from our operations. Our 2018 Sustainability Report announced our SBTi approved goal, with a target of reducing absolute total Scope 1 and 2 GHG emissions by 35% by 2030. The goal includes efforts to reduce landfill emissions, fleet emissions and building emissions. This response is focused on those suppliers that provide products or services that help Republic reduce our operational emissions. The percent of suppliers is an estimate and some suppliers are involved in multiple aspects of this initiative.

Impact of engagement, including measures of success
Our measure of success for these initiatives is achievement of our GHG reduction goal. We must pursue tangible actions to collaborate with suppliers in pursuit of making progress toward the GHG reduction goal. We strive to maximize the collection of gas within the landfill to minimize potential fugitive emissions and maintain landfill health. This part of the engagement includes working with suppliers that can provide landfill gas collection equipment, help us develop landfill gas to energy projects, provide products and services that help us divert materials from landfills that create methane while decomposing and invest in new technologies to improve our landfill emissions controls. As an example, in 2019 we increased the amount of landfill gas recovered from our landfills by 3.12%. One contributor to this progress was Morrow Renewables, a recognized leader among renewable natural gas developers. Morrow Renewables built and operates the upgrades to the landfill gas to energy project at Blue Ridge Landfill in Texas. Morrow partners with Republic on three renewable energy projects in Texas. In addition, we work together with a number of suppliers to develop engines, equipment and fuel that improve our fuel efficiency and fleet carbon footprint, thereby reducing the climate impact of our services. Initiatives include CNG engines, CNG fueling stations, RNG fuel supply and purchase, and electric vehicles. We have been ramping up our use of alternative fuel vehicles since 2016, working with project developers, RNG suppliers, and electric vehicle manufacturers. In 2021, approximately 21% of our fleet operated on alternative fuel. Through these activities we were able to reduce our use of diesel fuel, resulting in a reduction in GHG emissions of over 290,400 MTCO2e. Finally, our new building construction and retrofits adhere to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards. This includes using products and services that help us achieve energy reduction, water conservation measures and the use of sustainable materials and design principles that enhance comfort.

Comment

C12.1b

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

Type of engagement & Details of engagement

Education/information sharing	Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

% of customers by number
75

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

Please explain the rationale for selecting this group of customers and scope of engagement
As reported in our 2021 SASB response, the percentage of customers receiving recycling services by service type is: residential - 75% small container - 26% large container - 26%. We selected customers who receive recycling services because of the significant impact that recycling has on emission avoidance and recycling education helps us achieve our circular economy goal. We have estimated the full lifecycle emissions impacts from our diversion activities at more than 18M metric tons avoided. Emissions from recycled materials and compost are calculated using methodologies and emission factors from the U.S. EPA's Waste Reduction Model (WARM), version 15.. GWPs are from the IPCC (2007) Fourth Assessment Report. We provide recycling services to a significant portion of our municipal customers. We offer recycling education to these customers as well as residential, industrial and commercial customers that are interested in or that have signed up for recycling services. Our recycling education campaign, Recycling Simplified program (https://recyclingsimplified.com/), is available to our customers and the broader community. These campaigns are designed to inform our customers and the general public about the value of recycling and how to recycle correctly. Education helps reduce contamination in the recycle stream which improves the sustainability of recycling as an offering. In addition to lifecycle GHG reductions, successful recycling improves the financial returns to both our company and the customer, while improving the quality of recovered materials that are sold to downstream re-processors.

Impact of engagement, including measures of success
There are two measures of success for this initiative. One is a benefit for our customers and includes reduction of waste sent to landfills (pounds or tons). A second measure of success is our ability to return more recycled commodities to the economy. We have a goal related to Circular Economy, which is to increase recovery of key materials by 40% on a combined basis by 2030 (from a 2017 baseline). This public goal is achieved in part by educating customers on what materials to recycle. Education reduces contamination in the recycle stream which helps us recover more and provide higher quality commodities to re-processors. Recycling education provides benefits to both Republic, our customers and communities. Republic received and processed over 6.2 million short tons of recycled material in our facilities in 2021. Every percentage of contamination represents increased cost to process, handle, re-process and dispose of non-recyclable material. Education can not only increase the amount of recyclables collected, but also decrease the amount of contamination. In 2021, we increased the recovery and resale of targeted commodities (cardboard, metals, plastics, organics, biogas and oil) to over 3.3 million tons. This marks a 7 percent increase in recycling since 2017. Benefits to our customers vary by customer. As an example, in working with a global $13.5B annual revenue food producer, we eliminated close to 22 million pounds of landfilled waste over a four-year period in the US. Financial benefits to our customers from recycling include a reduction in their trash hauling service and lower landfill disposal charges. These benefits lead to lower GHG emissions in a variety of ways – reduced transportation, reduced emissions from landfills and reduced need for virgin materials (plastic, cardboard, etc.).

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?
Yes, climate-related requirements are included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement
Complying with regulatory requirements

Description of this climate related requirement
We continue to make progress toward our ambitious sustainability goals, which are designed to significantly benefit the environment and society while enhancing the foundation and profitability of our business for the long term. Republic is committed to doing our part to create a cleaner, safer, and healthier world where people thrive – not just for today, but for generations to come. As part of this commitment, we expect our Suppliers to responsibly manage their impact on the environment and our communities by operating efficiently and minimizing adverse impacts while complying with all applicable federal, state, and local environmental laws and regulations. We also encourage our suppliers to develop a sustainable procurement program for their own suppliers.

% suppliers by procurement spend that have to comply with this climate-related requirement
100

% suppliers by procurement spend in compliance with this climate-related requirement
100

Mechanisms for monitoring compliance with this climate-related requirement
Grievance mechanism/Whistleblowing hotline

Response to supplier non-compliance with this climate-related requirement
Retain and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate
Yes, we engage indirectly through trade associations

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?
Yes

Attach commitment or position statement(s)
Press Release of SBT.pdf

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy
We engage with trade associations to collaborate with others in our industry to align on best practices for reporting and regulations as it pertains to our industry. Republic Services also provides feedback to our trade partners on upcoming legislation, such as the impending SEC climate disclosures, for improvements and considerations to be made for the highest level of compliance and transparency.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association
Other, please specify (National Waste & Recycling Association (NWRA))

Is your organization's position on climate change consistent with theirs?
Consistent

Has your organization influenced, or is your organization attempting to influence their position?
We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)
The mission of the NWRA (wasterecycling.org/page/Federal) is to provide leadership, advocacy, research, education and safety expertise to promote the North American waste and recycling industries, serve as their voice and create a climate where members prosper and provide safe, economically sustainable and environmentally sound services. Given the relationship between climate change and waste, there are a number of areas where NWRA states a position that can influence climate change. Their current agenda includes the following: Recycled Materials - NWRA urges Congress and federal regulatory agencies to implement policies that encourage development of the domestic market for recycled materials through federal grants and tax incentives. Energy Generation - NWRA supports the continued use of landfill produced methane gas as a renewable energy product. Food Waste - NWRA encourages adoption of "The Food Recovery Act" establishing grants and loans for facilities to install anaerobic digesters that use food or crop waste to produce energy.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

Describe the aim of your organization's funding
<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.4

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

Publication
In mainstream reports, incorporating the TCFD recommendations

Status
Complete

Attach the document
2021-Republic-Services-GRI-Report.pdf
2021-Republic-Services-SASB-Report.pdf
2021-Republic-Services-TCFD-Report.pdf
2021-Republic-Services-Sustainability-Report.pdf

Page/Section reference
TCFD pages 22-27

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
We publish our emissions and response to climate change in a number of frameworks outside of CDP. To review our most current responses please visit our website at https://www.republicservices.com/organizational-sustainability. Reports include: - TCFD - GRI - SASB - Republic Services Sustainability Report

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, executive management-level responsibility	At Republic Services we take meaningful steps to minimize, restore or, if necessary, offset the impacts of our operations as it relates to biodiversity. Which is why we're preserving open space and habitats for native plants and wildlife and creating opportunities for public access and environmental education at many of our landfills. Examples of our biodiversity projects can be found in the Climate Leadership section of our sustainability report at: https://www.republicservices.com/cms/documents/sustainability_reports/2021-Republic-Services-Sustainability-Report.pdf	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have endorsed initiatives only	<Not Applicable>	SDG

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?	Portfolio
Row 1	No, but we plan to assess biodiversity-related impacts within the next two years	<Not Applicable>

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Land/water management Species management Education & awareness

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No, we do not use indicators, but plan to within the next two years	Please select

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Impacts on biodiversity	2021-Republic-Services-Sustainability-Report.pdf

C16. 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.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	COO	Chief Operating Officer (COO)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	11295000000

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member
American Airlines Group Inc

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
248.41

Uncertainty (±%)
5

Major sources of emissions
Landfill fugitive emissions, fleet and heavy equipment.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
1850

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services' Scope 1 profile, which finds that roughly 88% of company Scope 1 emissions are due to our customers' organic material decomposing in our landfills. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's emissions. This percentage was applied to Republic Services' total Scope 1 emissions to determine the Scope 1 emissions allocated to each customer. Republic Services' Scope 1 emissions include emissions due to transportation and landfilling of waste. All Scope 1 emission sources have completed Limited Assurance by a 3rd party verifier. This reporting does not include LCA emission reductions of materials that are recycled or composted. We encourage our customers to engage in these activities and as such feel that the quantification of emissions saved would be of value to them. Using the EPA WARM model v15 to perform a LCA on material that is recycled and composted, we find that the Scope 1 emissions are actually negative by – 90.09 tonnes of CO2e. We calculate that approximately 17% of American Airlines material collected by Republic is recycled.

Requesting member
American Airlines Group Inc

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
4.01

Uncertainty (±%)
5

Major sources of emissions
Offices and other facilities.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
1850

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 2 profile, which consists of all electricity purchases and consumption. To allocate total Scope 2 emissions at a customer level, Republic Services uses the market value of the collection services delivered to a customer from total revenue.

Requesting member
American Airlines Group Inc

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
65.04

Uncertainty (±%)
5

Major sources of emissions
Upstream Transportation and Distribution (e.g., 3rd Party Haulers and Subcontract Collection services) and Business Travel.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
1850

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 3 profile, which consists of upstream transportation activities associated with third party hauling/subcontracting, as well as corporate business travel including air and rental vehicles. All Scope 3 emission sources have completed Limited Assurance by a 3rd party verifier. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's Scope 3 emissions.

Requesting member
CSX Corporation

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
802.58

Uncertainty (±%)
5

Major sources of emissions
Landfill fugitive emissions, fleet and heavy equipment.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
5976

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services' Scope 1 profile, which finds that roughly 90% of company Scope 1 emissions are due to our customers' organic material decomposing in our landfills. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's emissions. This percentage was applied to Republic Services' total Scope 1 emissions to

determine the Scope 1 emissions allocated to each customer. Republic Services' Scope 1 emissions include emissions due to transportation and landfilling of waste. All Scope 1 emission sources have completed Limited Assurance by a 3rd party verifier. This reporting does not include LCA emission reductions of materials that are recycled or composted. We encourage our customers to engage in these activities and as such feel that the quantification of emissions saved would be of value to them. Using the EPA WARM model v15 to perform a LCA on that material that is landfilled and composted, we find that the Scope 1 emissions are actually negative by – 840.37 tonnes of CO2e. We calculate that approximately 10% of CSX Corporation's material collected by Republic is recycled.

Requesting member
CSX Corporation

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
12.94

Uncertainty (±%)
5

Major sources of emissions
Offices and other facilities.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
5976

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 2 profile, which consists of all electricity purchases and consumption. To allocate total Scope 2 emissions at a customer level, Republic Services uses the market value of the collection services delivered to a customer from total revenue.

Requesting member
CSX Corporation

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
210.14

Uncertainty (±%)
5

Major sources of emissions
Upstream Transportation and Distribution (e.g., 3rd Party Haulers and Subcontract Collection services) and Business Travel.

Verified
No

Allocation method
Allocation based on the market value of products purchased

Market value or quantity of goods/services supplied to the requesting member
5976

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 3 profile, which consists of upstream transportation activities associated with third party hauling/subcontracting, as well as corporate business travel including air and rental vehicles. All Scope 3 emission sources have completed Limited Assurance by a 3rd party verifier. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's Scope 3 emissions.

Requesting member
CVS Health

Scope of emissions
Scope 1

Allocation level

Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
22654.61

Uncertainty (±%)
5

Major sources of emissions
Landfill fugitive emissions, fleet and heavy equipment.

Verified
No

Allocation method
Allocation based on the market value of products purchased

Market value or quantity of goods/services supplied to the requesting member
168708

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services' Scope 1 profile, which finds that roughly 90% of company Scope 1 emissions are due to our customers' organic material decomposing in our landfills. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's emissions. This percentage was applied to Republic Services' total Scope 1 emissions to determine the Scope 1 emissions allocated to each customer. Republic Services' Scope 1 emissions include emissions due to transportation and landfilling of waste. All Scope 1 emission sources have completed Limited Assurance by a 3rd party verifier. This reporting does not include LCA emission reductions of materials that are recycled or composted. We encourage our customers to engage in these activities and as such feel that the quantification of emissions saved would be of value to them. Using the EPA WARM model v15 to perform a LCA on that material that is landfilled and composted, we find that the Scope 1 emissions are actually negative by – 159,113.26 tonnes of CO2e. We calculate that approximately 30% of CVS Health's material collected by Republic is recycled.

Requesting member
CVS Health

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
365.38

Uncertainty (±%)
5

Major sources of emissions
Offices and other facilities.

Verified
No

Allocation method
Allocation based on the market value of products purchased

Market value or quantity of goods/services supplied to the requesting member
168708

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 2 profile, which consists of all electricity purchases and consumption. To allocate total Scope 2 emissions at a customer level, Republic Services uses the market value of the collection services delivered to a customer from total revenue.

Requesting member
CVS Health

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
5931.51

Uncertainty (±%)
5

Major sources of emissions
Upstream Transportation and Distribution (e.g., 3rd Party Haulers and Subcontract Collection services) and Business Travel.

Verified
No

Allocation method
Allocation based on the market value of products purchased

Market value or quantity of goods/services supplied to the requesting member
168708

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 3 profile, which consists of upstream transportation activities associated with third party hauling/subcontracting, as well as corporate business travel including air and rental vehicles. All Scope 3 emission sources have completed Limited Assurance by a 3rd party verifier. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's Scope 3 emissions.

Requesting member
International Paper Company

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
3414.42

Uncertainty (±%)
5

Major sources of emissions
Landfill fugitive emissions, fleet and heavy equipment.

Verified
No

Allocation method
Allocation based on the market value of products purchased

Market value or quantity of goods/services supplied to the requesting member
25427

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services' Scope 1 profile, which finds that roughly 90% of company Scope 1 emissions are due to our customers' organic material decomposing in our landfills. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's emissions. This percentage was applied to Republic Services' total Scope 1 emissions to determine the Scope 1 emissions allocated to each customer. Republic Services' Scope 1 emissions include emissions due to transportation and landfilling of waste. All Scope 1 emission sources have completed Limited Assurance by a 3rd party verifier. This reporting does not include LCA emission reductions of materials that are recycled or composted. We encourage our customers to engage in these activities and as such feel that the quantification of emissions saved would be of value to them. Using the EPA WARM model v15 to perform a LCA on that material that is landfilled and composted, we find that the Scope 1 emissions are actually negative by – 25,990.59 tonnes of CO2e. We calculate that approximately 32% of International Paper Company's material collected by Republic is recycled.

Requesting member
International Paper Company

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
55.07

Uncertainty (±%)
5

Major sources of emissions
Offices and other facilities.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
25427

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 2 profile, which consists of all electricity purchases and consumption. To allocate total Scope 2 emissions at a customer level, Republic Services uses the market value of the collection services delivered to a customer from total revenue.

Requesting member
International Paper Company

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
893.98

Uncertainty (±%)
5

Major sources of emissions
Upstream Transportation and Distribution (e.g., 3rd Party Haulers and Subcontract Collection services) and Business Travel.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
25427

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 3 profile, which consists of upstream transportation activities associated with third party hauling/subcontracting, as well as corporate business travel including air and rental vehicles. All Scope 3 emission sources have completed Limited Assurance by a 3rd party verifier. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's Scope 3 emissions.

Requesting member
National Grid PLC

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
180.02

Uncertainty (±%)
5

Major sources of emissions
Landfill fugitive emissions, fleet and heavy equipment.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
1341

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services' Scope 1 profile, which finds that roughly 90% of company Scope 1 emissions are due to our customers' organic material decomposing in our landfills. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's emissions. This percentage was applied to Republic Services' total Scope 1 emissions to determine the Scope 1 emissions allocated to each customer. Republic Services' Scope 1 emissions include emissions due to transportation and landfilling of waste. All

Scope 1 emission sources have completed Limited Assurance by a 3rd party verifier. This reporting does not include LCA emission reductions of materials that are recycled or composted. We encourage our customers to engage in these activities and as such feel that the quantification of emissions saved would be of value to them. Using the EPA WARM model v15 to perform a LCA on that material that is landfilled and composted, we find that the Scope 1 emissions are actually negative by – 846.55 tonnes of CO2e. We calculate that approximately 20% of National Gird PLC's material collected by Republic is recycled.

Requesting member
National Grid PLC

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
2.9

Uncertainty (±%)
5

Major sources of emissions
Offices and other facilities.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
1341

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 2 profile, which consists of all electricity purchases and consumption. To allocate total Scope 2 emissions at a customer level, Republic Services uses the market value of the collection services delivered to a customer from total revenue.

Requesting member
National Grid PLC

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
47.13

Uncertainty (±%)
5

Major sources of emissions
Upstream Transportation and Distribution (e.g., 3rd Party Haulers and Subcontract Collection services) and Business Travel.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
1341

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 3 profile, which consists of upstream transportation activities associated with third party hauling/subcontracting, as well as corporate business travel including air and rental vehicles. All Scope 3 emission sources have completed Limited Assurance by a 3rd party verifier. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's Scope 3 emissions.

Requesting member
Schlumberger Limited

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
843.7

Uncertainty (±%)
5

Major sources of emissions
Landfill fugitive emissions, fleet and heavy equipment.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
6283

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services' Scope 1 profile, which finds that roughly 90% of company Scope 1 emissions are due to our customers' organic material decomposing in our landfills. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's emissions. This percentage was applied to Republic Services' total Scope 1 emissions to determine the Scope 1 emissions allocated to each customer. Republic Services' Scope 1 emissions include emissions due to transportation and landfilling of waste. All Scope 1 emission sources have completed Limited Assurance by a 3rd party verifier. This reporting does not include LCA emission reductions of materials that are recycled or composted. We encourage our customers to engage in these activities and as such feel that the quantification of emissions saved would be of value to them. Using the EPA WARM model v15 to perform a LCA on that material that is landfilled and composted, we find that the Scope 1 emissions are actually negative by – 696 tonnes of CO2e. We calculate that approximately 6% of Schlumberger Limited's material collected by Republic is recycled.

Requesting member
Schlumberger Limited

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
13.61

Uncertainty (±%)
5

Major sources of emissions
Offices and other facilities.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
6283

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 2 profile, which consists of all electricity purchases and consumption. To allocate total Scope 2 emissions at a customer level, Republic Services uses the market value of the collection services delivered to a customer from total revenue.

Requesting member
Schlumberger Limited

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
220.9

Uncertainty (±%)
5

Major sources of emissions
Upstream Transportation and Distribution (e.g., 3rd Party Haulers and Subcontract Collection services) and Business Travel.

Verified
No

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
6283

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The GHG source was identified using Republic Services Scope 3 profile, which consists of upstream transportation activities associated with third party hauling/subcontracting, as well as corporate business travel including air and rental vehicles. All Scope 3 emission sources have completed Limited Assurance by a 3rd party verifier. The fraction resulting from the tons of material collected from a single customer compared to the total tons of material that Republic Services collects from all customers is used to determine individual customer's Scope 3 emissions.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

Republic Services Scope 1, 2 and 3 emissions were reported to the CDP in July 2022 and are included in the Republic Services 2021 GRI Report found at www.republicservices.com/sustainability.
For the LCA estimates using the EPA WARM Model v15, the methodologies used to develop these emission factors, user guides and other documentation are described in detail in the background reports and are available for download at https://www.epa.gov/warm.

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Other, please specify (Complexity of waste/material solutions)	The calculations around waste/material logistics are complex with multiple nuances including data issues with 3rd party vendors, access to data for weight of material collected for individual locations, using a modeled not measured approach, and the dynamic nature of our operations' routes. Depending on the number of locations for a given customer, these calculations get complex quickly. We are exploring the use of software tools to improve this calculation methodology and process, but we would still have gaps with the small supplier data. Additionally, we are exploring advanced measurement technology such as drone or satellite landfill surveys to give more precise emission figures.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?
Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

We are looking to improve the allocation methodology by matching a customer to the specific landfills they are utilizing across the country. When we model the Company's landfill emissions we take into account the landfill's gas collection efficiency, type of cover used, and location-specification climate, etc. Because landfills vary so greatly in their emissions profiles, the ability to match a customer to the landfills they are utilizing will provide even greater understanding of their impact. However, we run into considerable challenges implementing this methodology, as outlined in SC1.3.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?
No

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

No, I am not providing data

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below

I have read and accept the applicable Terms